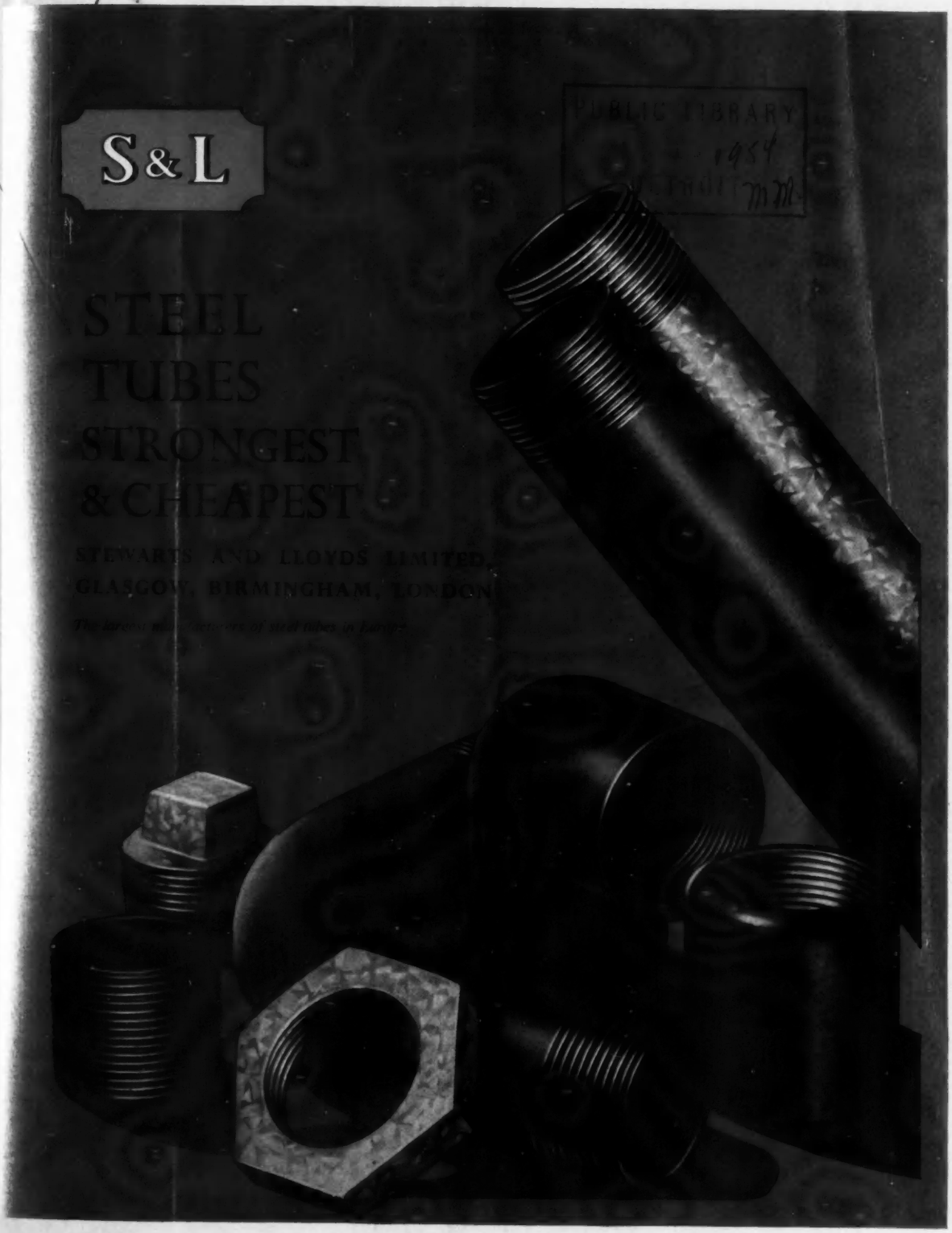
TECHNOLOGY DEPT.

Gas Journal

VOL. 277 / 106TH YEAR. LONDON, JANUARY 27, 1954 NO. 4730. PRICE 1/3



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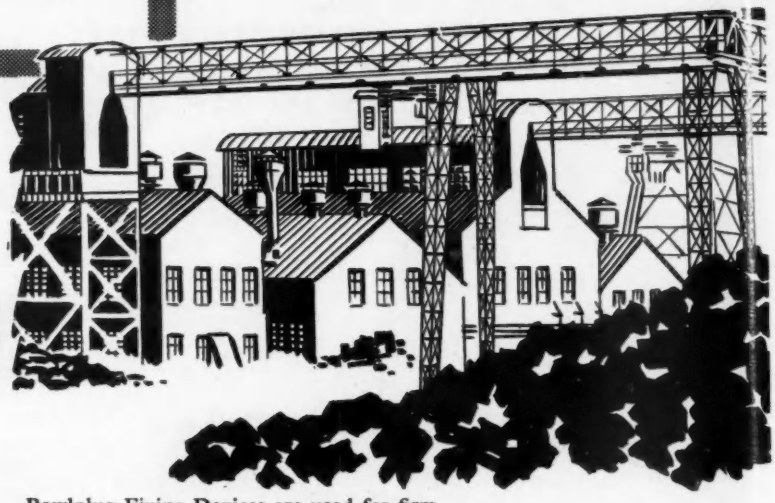

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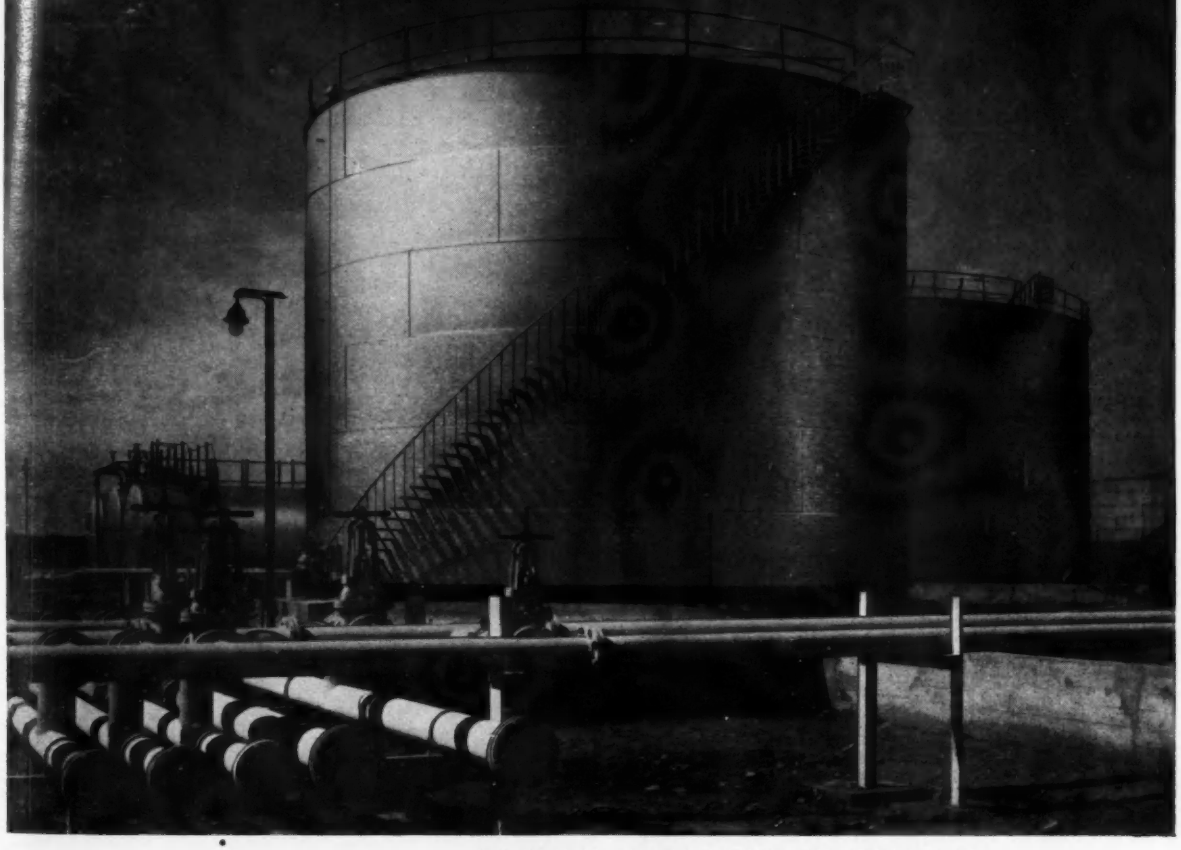

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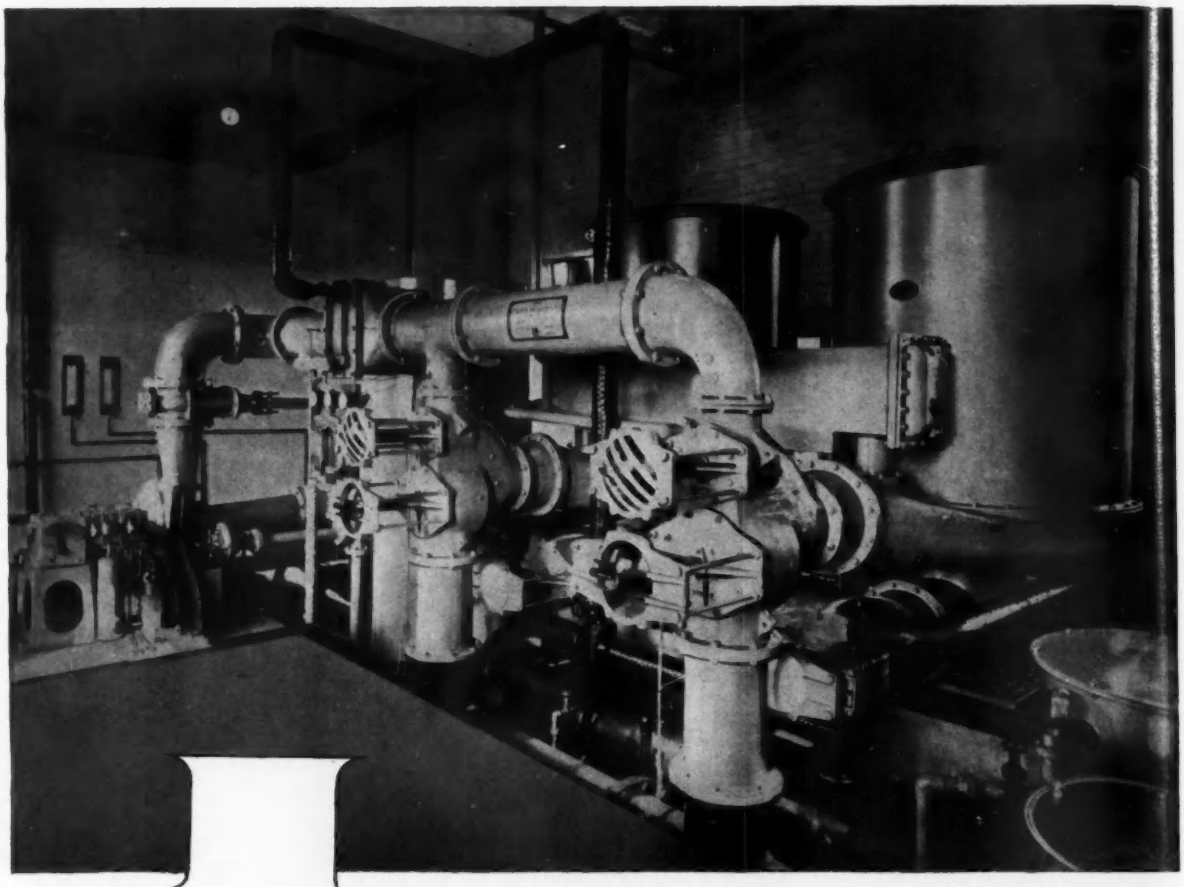

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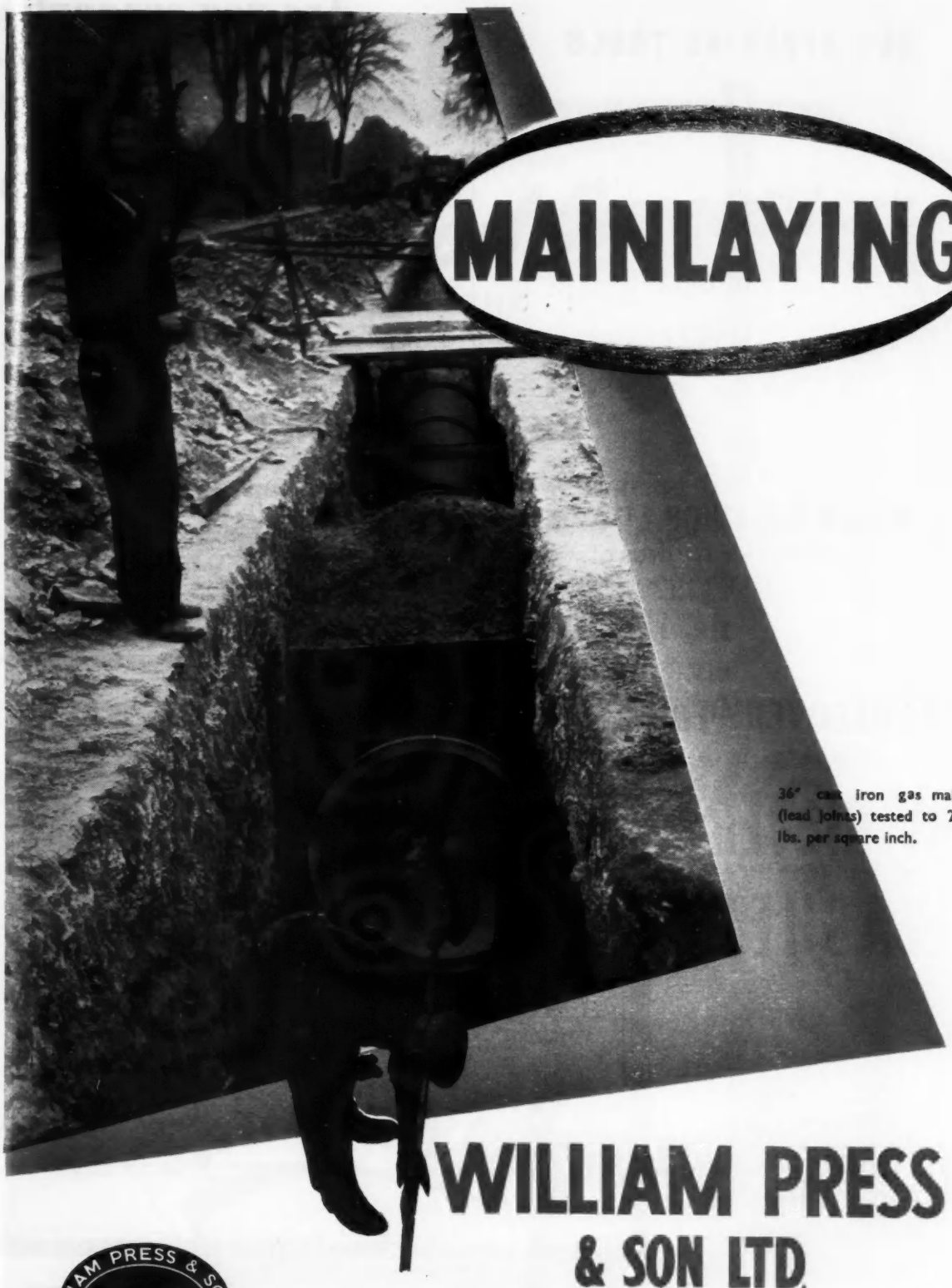

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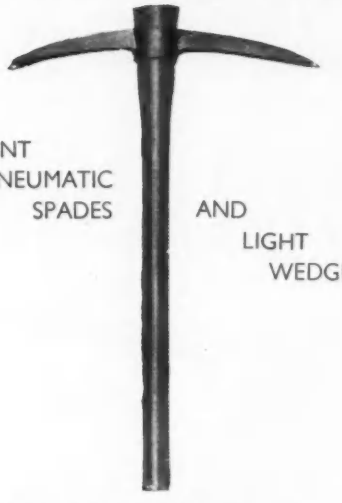

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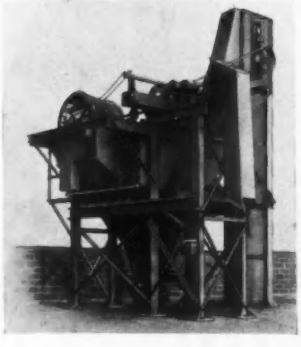

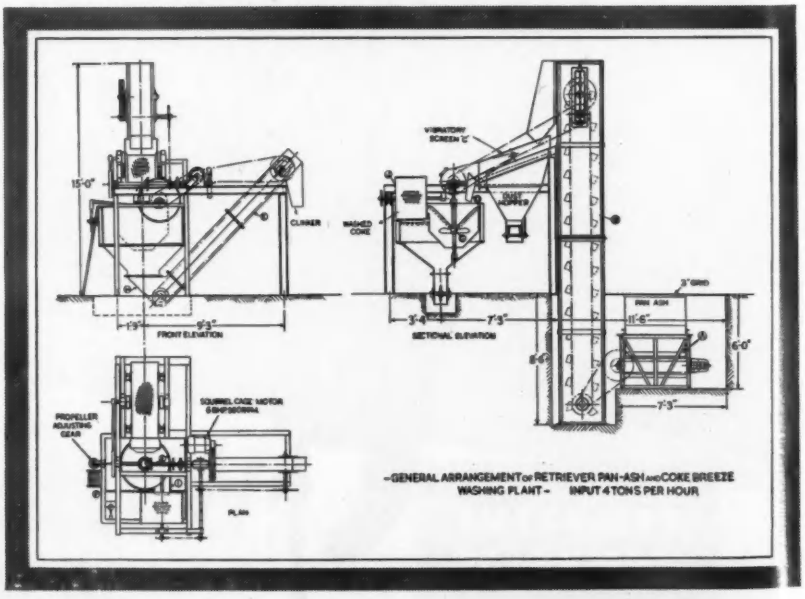

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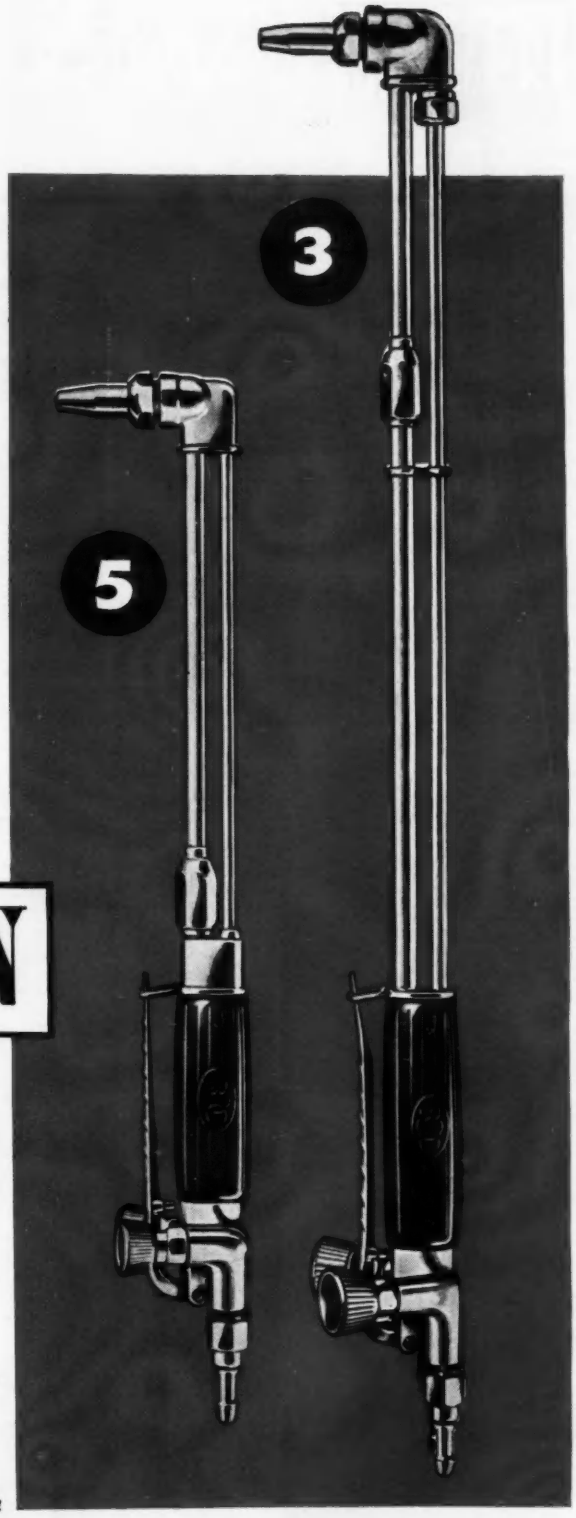

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1 A robust Cutter. Cuts 12 ins. mild steel and 4 in. cast iron.
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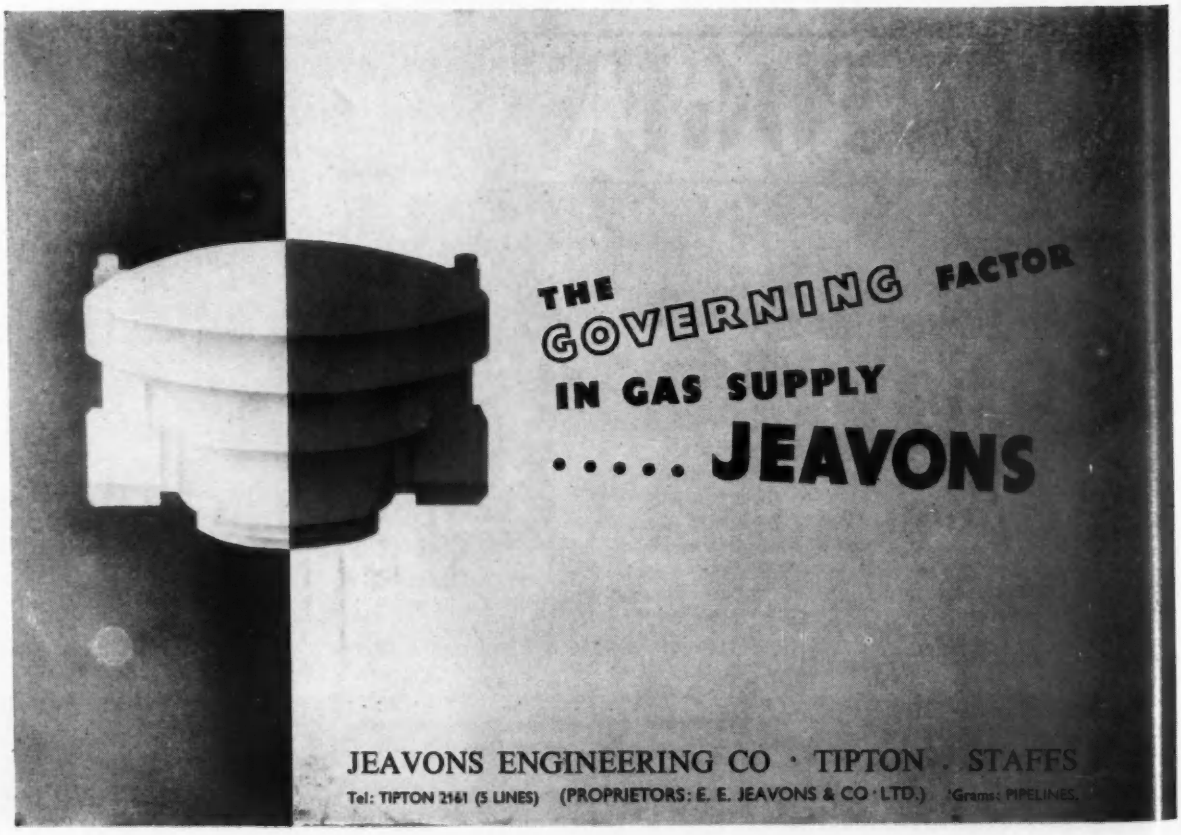
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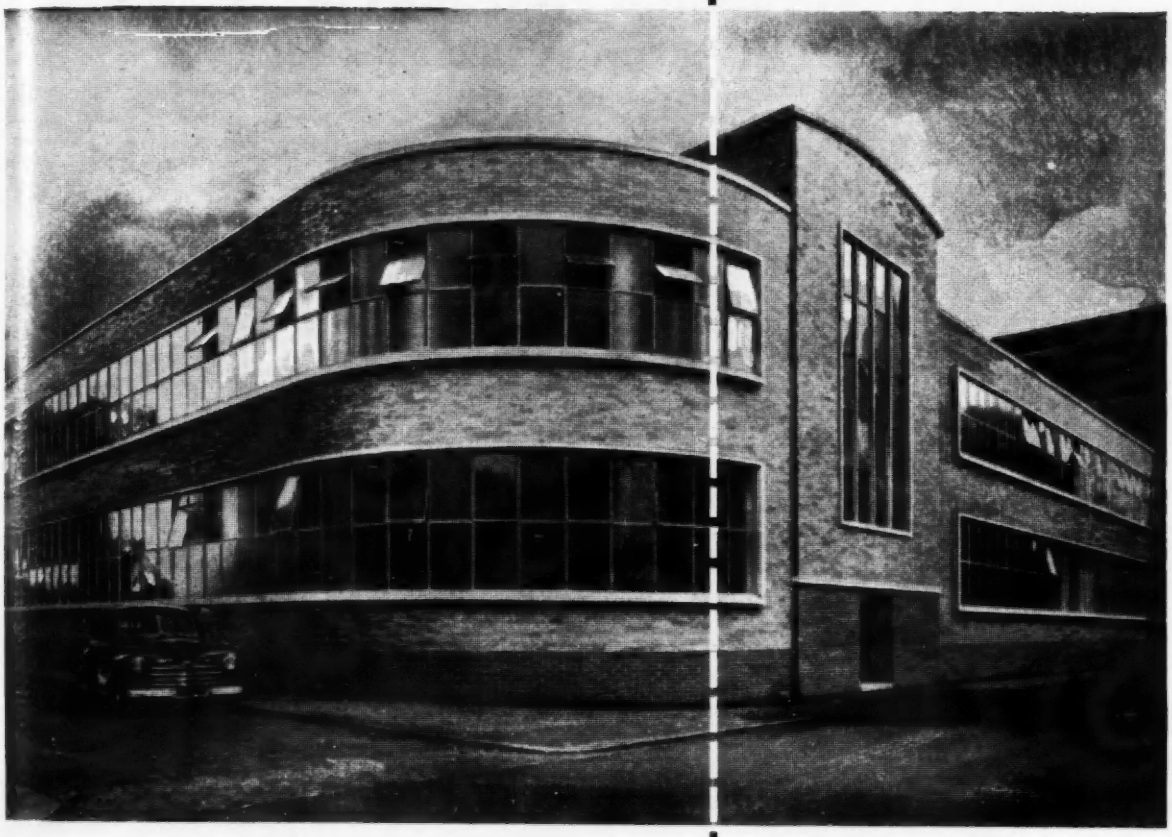

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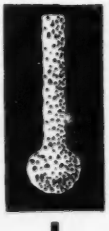

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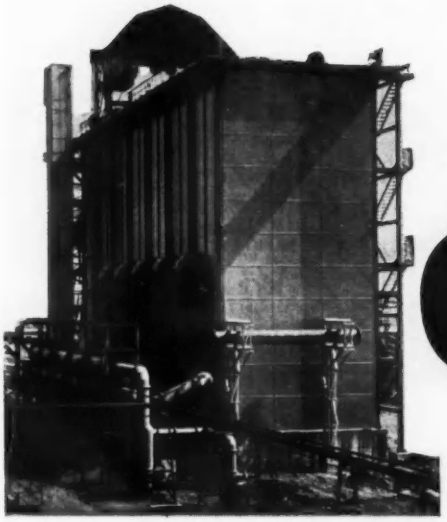
AND WE HOLD THE JOB UP

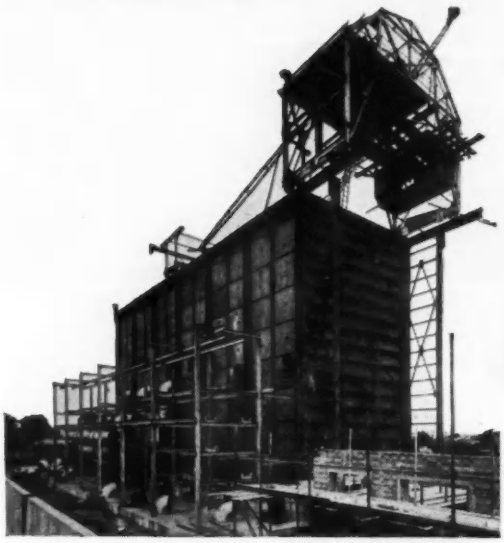
These Tower Box Purifiers are going up



One

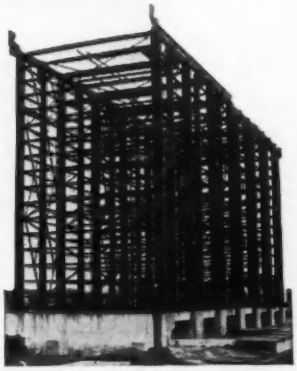
The first large Balfour-Lecocq Tower Box Purifier was completed at Rotherham. Its capacity soon to be doubled to 20,000,000 cu. ft. per day. A second purifier of 7,500,000 cu. ft. per day nears completion at Southall. The foundations are laid for a third at Bow Common.

The main reasons for the ready adoption of the Tower Box purifier are because it has fool-proof jointing between trays, and is fully mechanised. By adoption of special arrangement of connections the changeover of Towers can be effected easily in a few minutes.



After

The unequalled technical resources of the Balfour organisation are at the service of those requiring detailed information on application of Tower Box purifiers or other gas equipment to their needs.



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Balfour OF LEVEN

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Gas works engineers have many uses for
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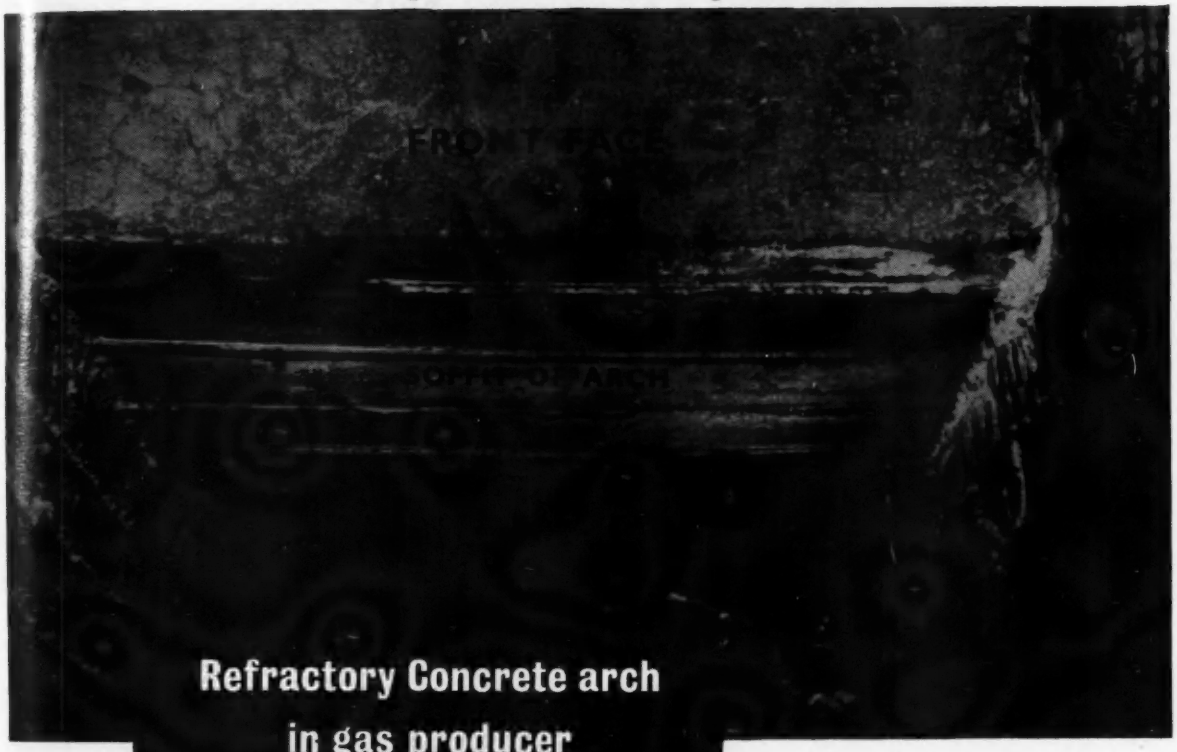
the adaptable refractory material



Refractory Concrete arch in gas producer *after 2 years Continuous Duty*

Photo by courtesy of J. W. Young Esq., M.Inst.Gas E., Lurgan Borough Council, Gas Dept.

The wide variety of uses for Refractory Concrete include Retort House Floors, foundations, door linings, Producer linings, charge hole blocks, retort settings, flues, flue pipes, flue linings, quenching floors and cars, coke shoots, top paving, inspection block and plugs, carburetter head tiles, dampers, lids, special shapes, sole patching, charge hole blocks, brickwork mortar and general repairs.

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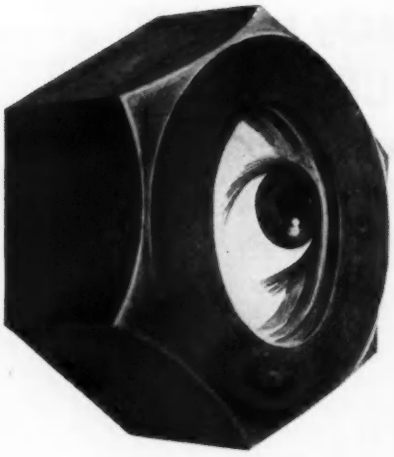

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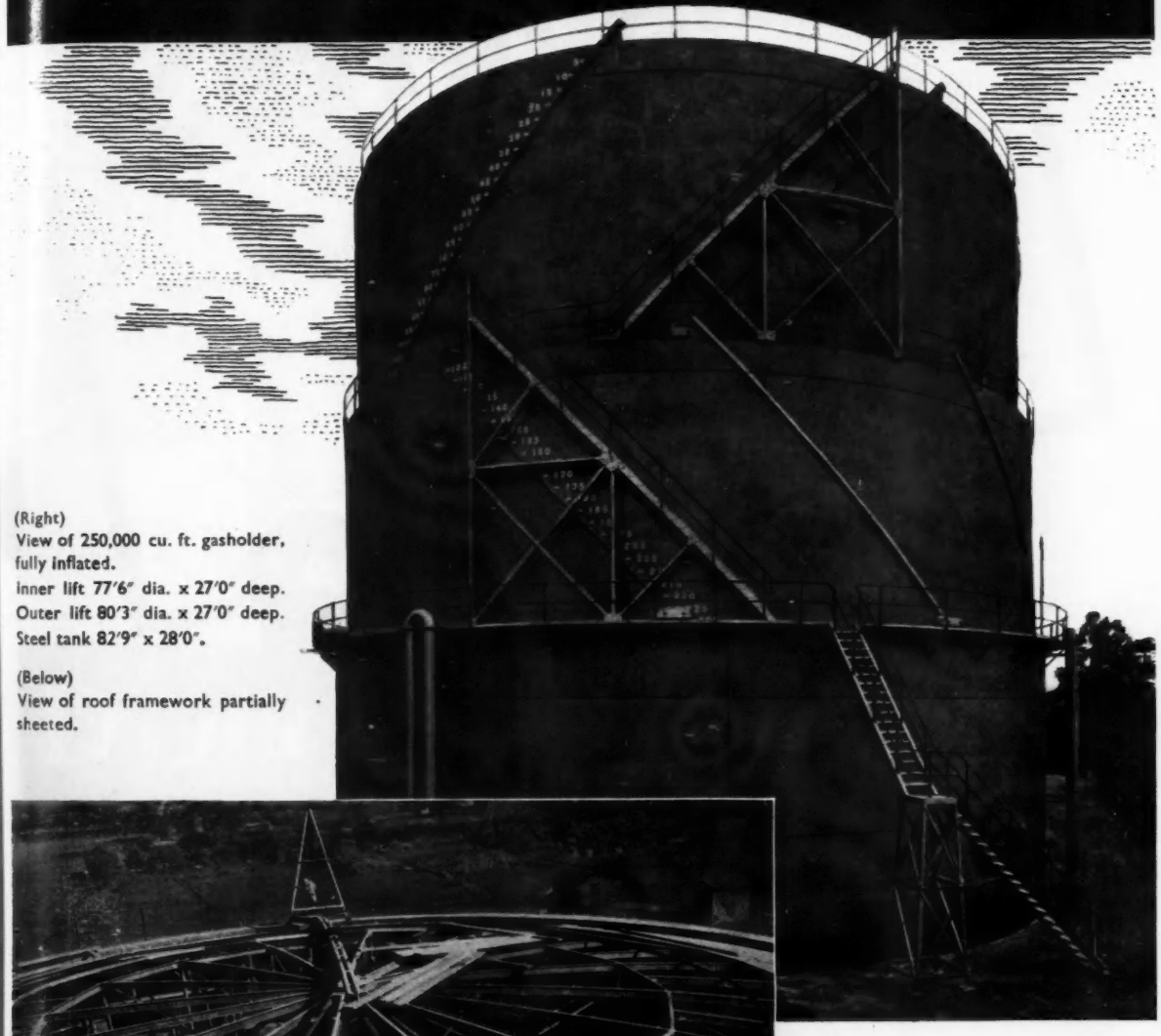

(Right)
View of 250,000 cu. ft. gasholder, fully inflated.
Inner lift 77'6" dia. x 27'0" deep.
Outer lift 80'3" dia. x 27'0" deep.
Steel tank 82'9" x 28'0".

(Below)
View of roof framework partially sheeted.

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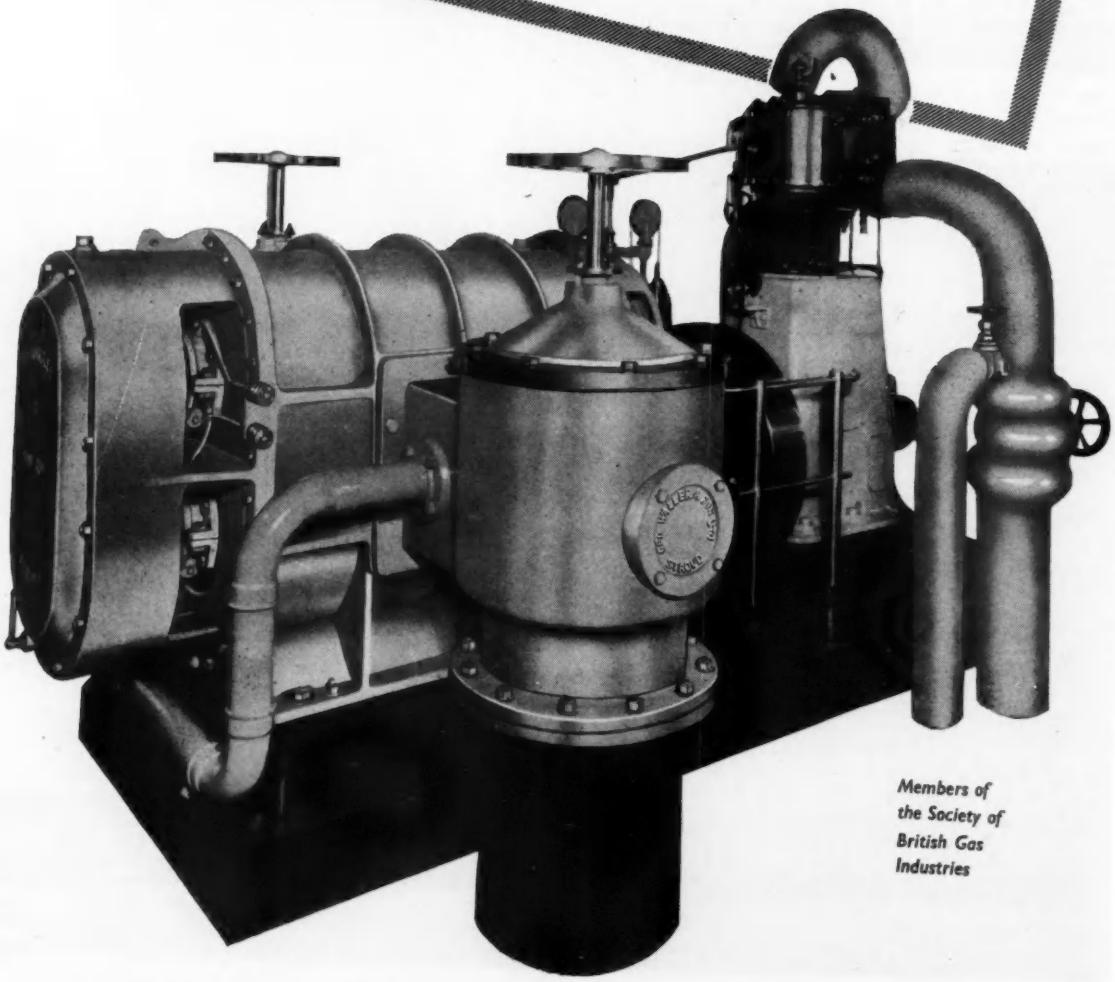

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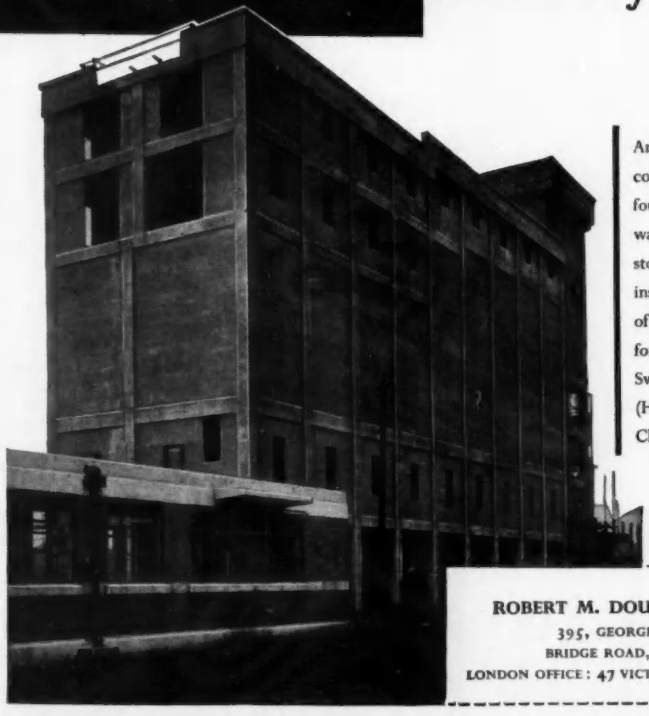

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THESE FIGURES MEAN LOW COST HANDLING

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3 tons 2 cwts of coke in 2 mins.

5 yards of sand in 3½ mins.

More than a ton a minute is the kind of loading performance that really cuts bulk handling costs, and, remember, with the 'Weatherill' Hydraulic this big appetite for heavy work can be maintained throughout the working day, for finger-tip control of the hydraulic rams, together with extra light steering means less driver fatigue and consequently no slacking-off.

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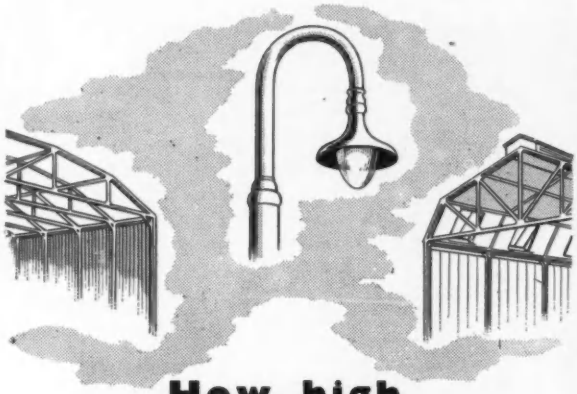

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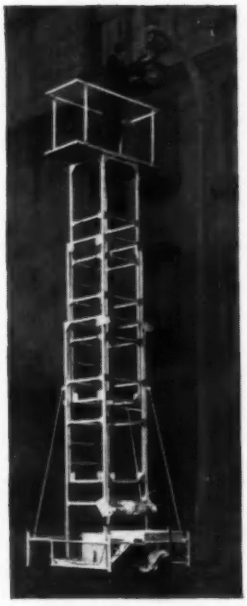

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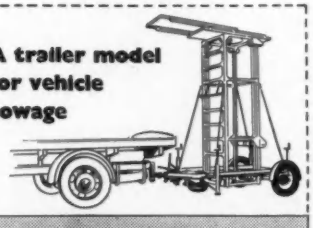

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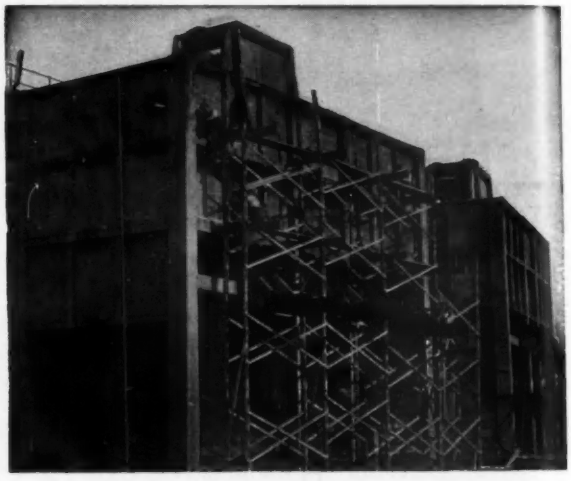

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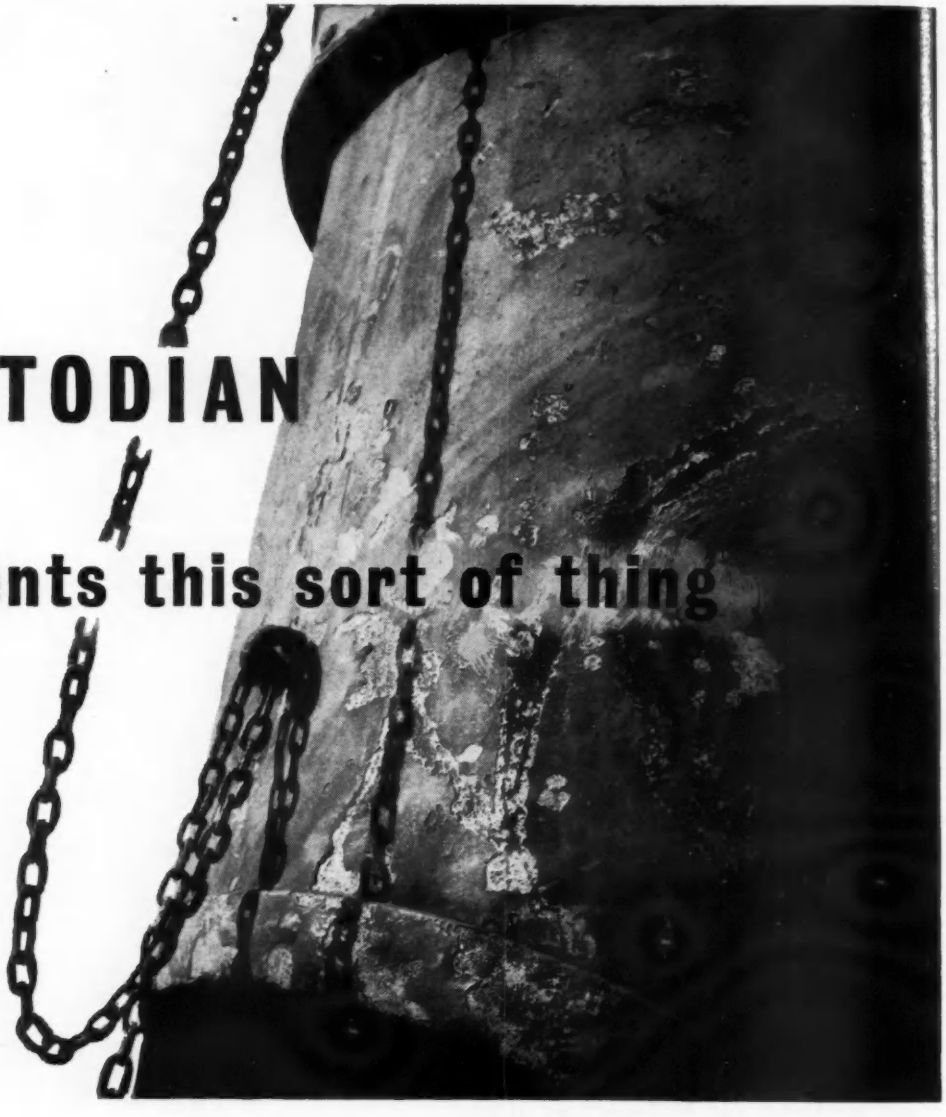

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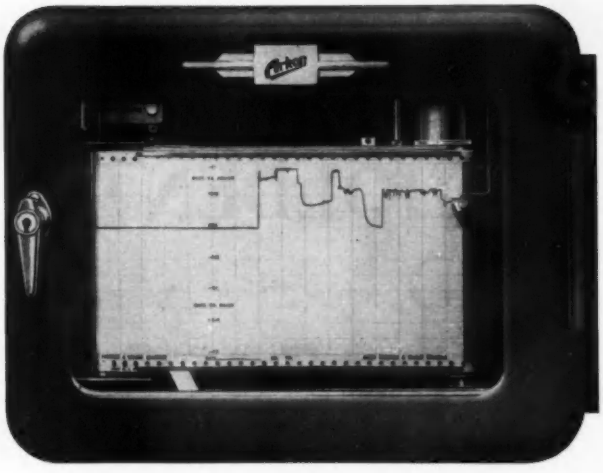

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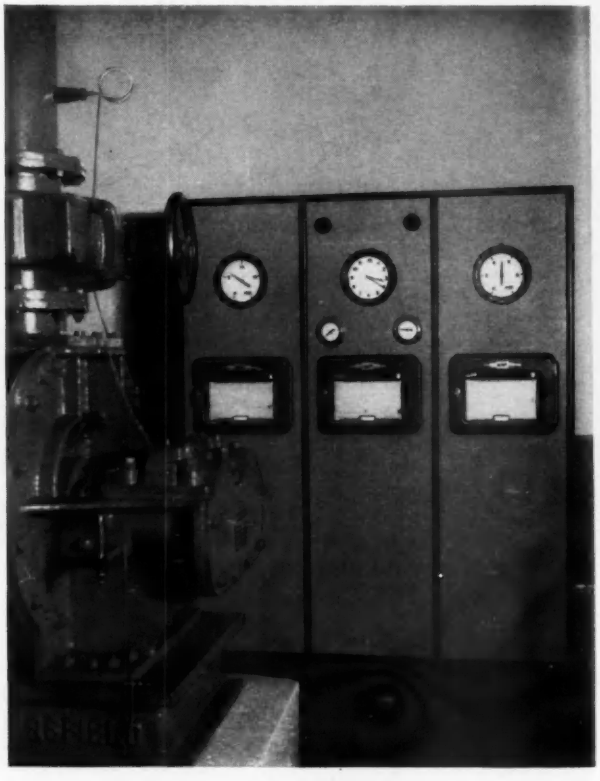

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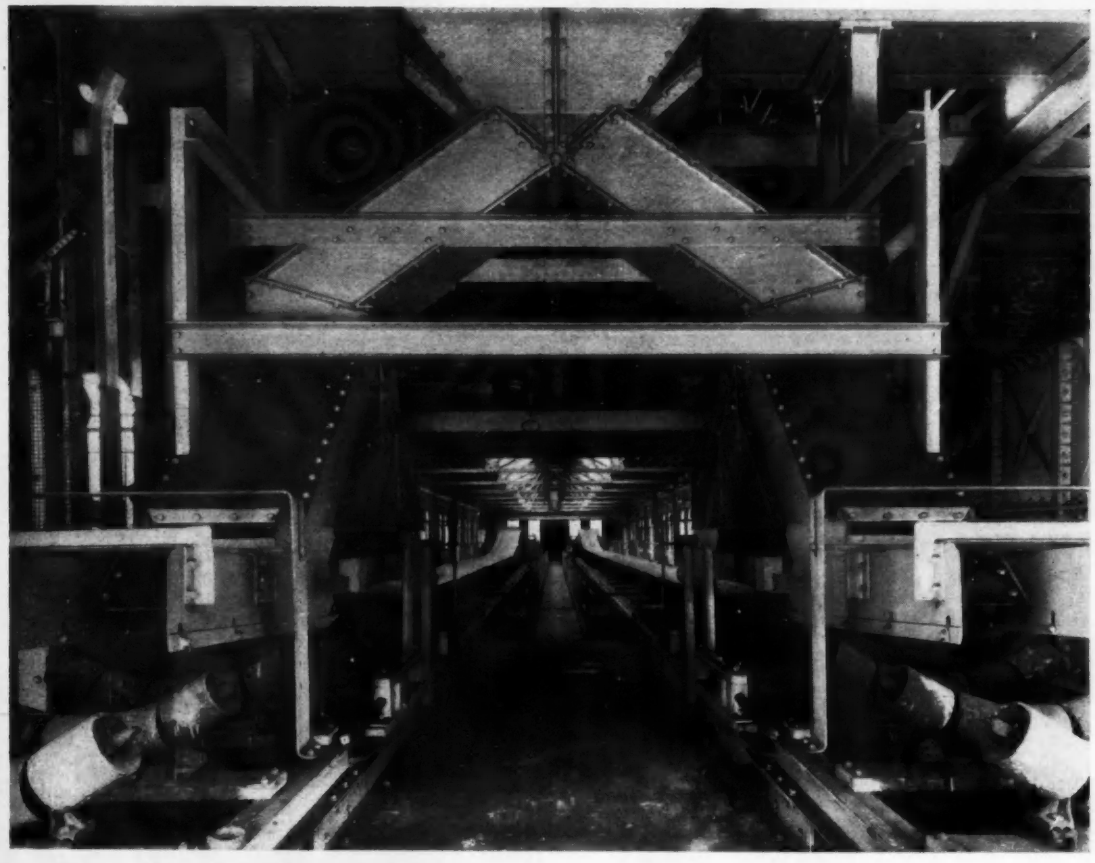

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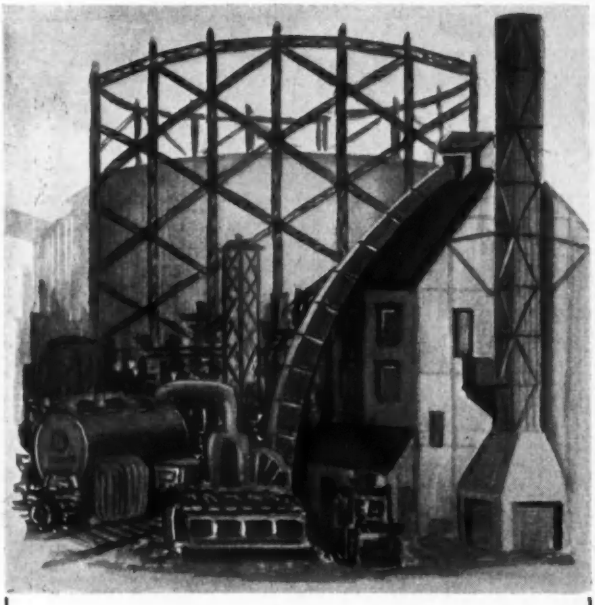

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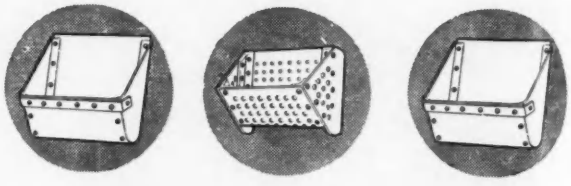

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1953 No. 1464
Made - - - - 1st October, 1953
Laid before Parliament 3rd October, 1953
Coming into Operation 1st January, 1954
(2) Open coal, coke or wood fires shall not be used for heating or drying ladles inside a workroom unless adequate measures are taken to prevent, so far as practicable, fumes or other impurities from entering into or remaining in the atmosphere of the workroom.
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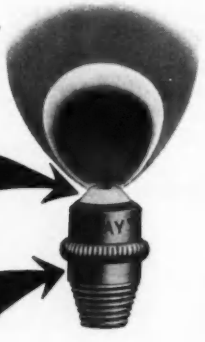

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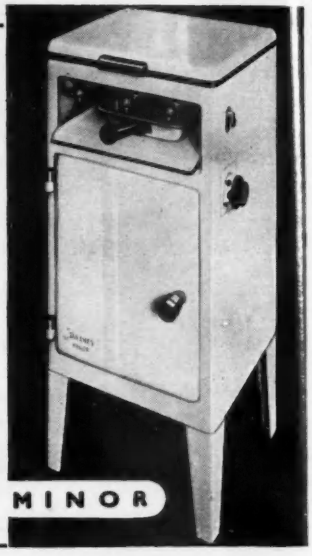

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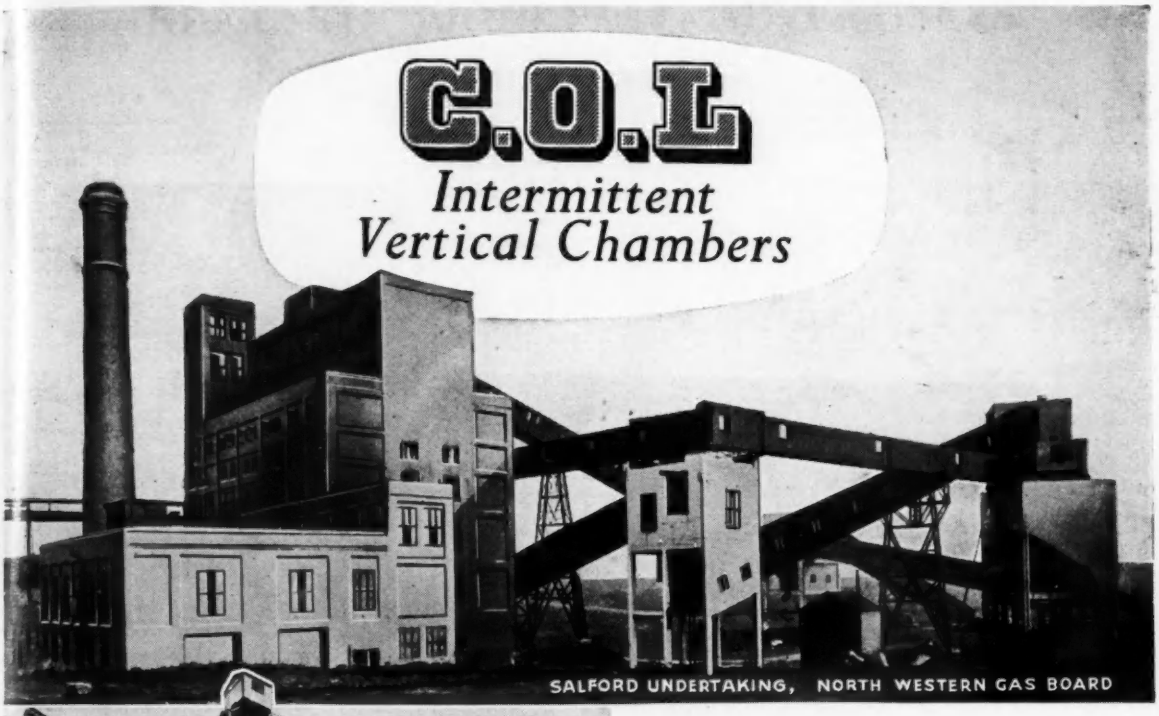

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106th YEAR OF PUBLICATION

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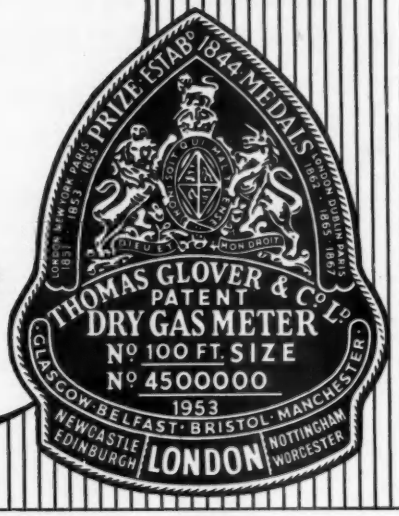

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IT is strange how much thought and praise is given to true craftsmanship and how little to the craftsmen who carry it out. For instance, thatched cottages and ricks have long been part of traditional England, yet the thatcher whose skill has been passed down from father to son, through many generations, goes his way unrecognised and unpraised, except by the 'expert few' who know.

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Gas Journal

VOL. 277. NO. 4730 106TH YEAR January 27, 1954

INTEGRATION IN THE NORTH WEST

The pre-war vision of integration and co-ordination of the gas industry was based upon a discontent with the too frequent coincidence of gas supply districts with local government areas. It was seen that in this, as in other forms of public utility, the local government areas had not kept pace with urban development. Many conurbations, areas where urban populations were spread continuously over large areas, still remained broken up under the control of several local authorities. Where gas supply was in the hands of private companies amalgamation went some way, in some cases a long way, to remove the inconvenience and economic weakness of interlocking areas of supply. But where undertakings were in the hands of local authorities amalgamations were thwarted by local 'patriotism,' and very little was done. In most of the areas set up under the recent Gas Act these difficulties have been removed.

The outstanding feature of the development in the North Western area, so brilliantly described by Mr. D. P. Welman, Chairman of the N.W.G.B., in his address to the North Western Fuel Luncheon Club on January 13, is its close adherence to the principles of integration as set out, for instance, in the last report of the Post-War Planning Committee. The secret is indicated in the title of Mr. Welman's address: 'Industrial Organisation as applied to a Nationalised Industry.' It is simply the application of normal industrial organisation to this particular problem; and while no doubt the organisation of other areas has adhered more or less closely to the same pattern, it must be admitted that that of the North Western area is a very good example of the realisation of the central idea.

Mr. Welman sees no reason why the nationalised gas industry should not be successful. He considers the division of the industry into 12 autonomous areas an excellent arrangement. He refuses to accept the view that the areas are too big. 'Nothing is too big if you can split it up into units of manageable size.' And that is what was done, in the first place by Colonel W. M. Carr and developed by Mr. Welman. The area was divided into 17 groups each with its 'centre of gravity' at an existing big undertaking. The drawing of the boundaries was, relatively, not difficult in most cases, as, for instance, those of the groups along the west coast. The delimitation of groups in the congested south east must have been much more difficult.

But the details of the organisation go far beyond the mere drawing of boundaries. They grow out of the genius of the Chairman himself in the management of the personnel of all ranks who serve the Board. Each group is a complete entity from the managerial point of view. The group general manager is entirely responsible for the management of the internal affairs of the group and responsible directly and only to the Chairman. There is no intermediary control. The Chairman is, in effect, managing director of a group of companies. Of course there are some directions in which group management comes into contact with area policy, to which it must give way. But even in these directions, Mr. Welman assures us that his area planning and production department is careful to work with and through the group manager. One gets the impression that the local operating technician, for instance, is in active partnership in the design and location of plant which he is called upon to operate. To throw away the possibilities of collaboration between operator and designer is a weakness in any organisation.

For further details of the organisation within the group we have the very fine paper presented last autumn to the Manchester Section by Mr. John Wilson, General Manager of the Manchester Group. Mr. Welman referred again to the district service managers working in direct contact with the consumer on one hand and with the general manager on the other. We venture to repeat the reflection we made on this point in commenting on Mr. Wilson's paper. If Mr. G. A. Service could be as well known and as approachable as the gas manager of the smaller undertaking was under the old regime, something great would be effected in the detailed organisation of the industry. That was a feature in some parts of the old regime which we do not want to lose.

In his address Mr. Welman touched on the delicate question of remuneration. It is clear that the old idea of a scale of salaries based on the capacity of undertakings has inevitably gone by the board. There is no parallel to it in the new organisation. It becomes a function of the higher management to determine what salary will in each case attract the right type of man for the job, and after that so to run the day-to-day management of the group and the area that there is adequate incentive for every officer and man to give of his best—to initiate and continue 'a clean form of competition among officers and men of all ranks . . . No organisation is better than the men who run it.'

Just one other point, among the many important ones

in this address, which demands comment is Mr. Welman's enlightened attitude to the Consultative Council. At first, he said, it was not surprising that Council members failed to distinguish the important from the unimportant aspects of gas supply from the consumers' point of view. But today, he added, the Council is becoming more and more helpful in a sort of two-way action. It brings consumers' troubles to the Board and it takes the Board's proposals back to the consumer. Neither this comment nor the brief report we have of Mr. Welman's address can convey anything but an imperfect idea of the pleasure enjoyed by its actual auditors. It was, besides, admirably suited to the mixed company of engineering and fuel technicians, including some electricians, to whom it was given, creating a very firm impression of the large-minded statesmanship behind the gas industry in the North West.

HOTELYMPIA

The word 'catering' is singularly broad in its application. Even when applied to the provision of food it still conjures up a variety of pictures: Military catering and the queue at the cook-house; horribly similar, the large self-service restaurant with its myriad little cottage pies and decimated lettuce leaves; the hole-in-corner Soho eatery, hiding its bad cooking behind a steep bill and Cypriot mysticism; and, of course, the luxury hotel. They all indulge in the practice of catering, but between catering as practised in the outside world and catering as it is understood in the specialised, rarefied atmosphere of the Hotel and Catering Exhibition there appears to be a tremendous gulf. Why is it that the highly gratifying determination to enable the public to eat like kings, evinced by practically everyone at Hotelympia, is so seldom discernible outside the confines of the hall? Perhaps the hoteliers and restaurateurs have split personalities. But it cannot be denied that the catering industry progresses—in one direction or another. Gone are the elderly, flat-footed waitresses who served us so kindly at our favourite A.B.C.; we now line up with our tin trays. It is more modern, more inhuman, and incidentally, usually much slower.

Be that as it may, there is a keen minority in positions of some significance which is passionately concerned about upgrading catering in this country, and eliminating those bad patches in the British menu which make it the wonder and the despair of the Continental, or even the American, visitor. Nowhere is their benign influence more keenly felt than at Hotelympia, and their cause is supported by many manufacturers—café boiler makers, for example—who seek to devise appliances which in their operation embody the essentials of good cooking or brewing practice. More power to them, these Davids who aim their missiles at the dulled palates of the catering Goliaths. It is good to know that our own Gas Council has jumped on the missionary bandwagon to the extent of demonstrating how the three black C's of catering in this country—cod, cabbage, and coffee—can be made palatable and exciting.

Last week we probed the half-light of Olympia to see how this noble endeavour was being received. It was an odd exploration into a world consisting of those who had and those who had not, light. The lucky ones—and there were not very many—smirked in isolated radiance; the remainder skulked in perpetual twilight from which could be heard the molar grinding of frustrated sales managers. The Gas Council had enough light not to cramp its demonstrating activities, although the rest of the stand was in cavernous gloom. Judging by what we saw of the stand the demonstrations were an unqualified success. The chestnut charm of Mrs. Sheila Monaghan, coping cleverly *sans* mike, introduced us to a magic world of fairy light *patisserie*, while we were enfolded in a heavenly aura of coffee. Mr. Tom Roberts took our breath (it was lay breath of course) away with a display of carving which made us approach the weekend joint with the faith of the true disciple. And Mr. Charles Calvetti, who is *Chef de Cuisine* at Broadcasting House, did more for cod and cabbage than Adolf Zukor ever did for Pola Negri. This was good stuff by any standard, and with the added advantage of the best stand the Gas Council has produced for a long time, the exhibit was a memorable one. Electricity, stuck in a dim corner, had no lights on at all 'for politic reasons.'

This is an impressive exhibition in that its atmosphere is keen and most of its visitors are ready to talk business. So are the 177 trade exhibitors, and we noted with pleasure the high incidence of gas appliances and the appearance of several new models of singular modernity and glamour. It is clear that our industry is out to hold this most valuable load. For the rest we must mention the *Salon Culinaire International de Londres*, a display as technically brilliant as it is aesthetically revolting. The Cenotaph in icing sugar may be somebody's idea of fun, but it is not ours. No doubt our displeasure was influenced by the lack of refrigeration facilities and the growing smell of aspic (or something).

NUCLEAR POWER

Last week an official account was published (as a book, *Britain's Atomic Factories*. H.M. Stationery Office; 5s.) giving the story, 'in such detail as security permits,' of the development of atomic energy in Great Britain—a project that has involved the design and construction of engineering works unequalled in this country for complexity, novelty, and size. In point of fact, within the past seven years an industry has arisen on which many millions of pounds have been spent, which employs thousands of workers, and to which all branches of the engineering and chemical industries have contributed.

Many people are now convinced that nuclear energy should be able to make a substantial contribution to the electricity supply of the country at a cost comparable with the cost of electricity generated by coal. And the book states that, 'if certain assumptions turn out to be valid, it might ultimately be possible completely to replace coal by nuclear fuel.' The British Electricity Authority estimates that its total requirements for coal are likely to increase to an annual rate of 63 mill. tons in the next 15 years; 'a saving of this magnitude would transform the nation's economy.' Even if it were physically possible, many years must elapse before such a goal could be reached, it is stated. 'A more immediate objective, one that might possibly be realised within 20 years, would be to set up a reactor system which would generate enough electricity to produce a

saving of 20 mill. tons of coal a year, the amount by which estimated production will fall short of estimated consumption during the next 15 to 20 years.'

This picture is far more optimistic than that painted by Professor F. E. Simon, Professor of Thermodynamics in the University of Oxford, who has recently contributed several articles to the *Financial Times*. He has pointed out that in 1975 the United States of America expects to have doubled its already high power consumption and to use three and a half times as much electricity as it does now. If we tried to reach the same *relative* figures we would need the equivalent of of 1,000 mill. tons of coal per year by 1975. But not even a third of this amount is likely, by any flight of the imagination, to be produced by that time, nor is it probable that our economic position will permit the importation of the corresponding amount of oil. If nothing is done to change this state of affairs, says Professor Simon, we are bound to run into most serious trouble in 10 or 20 years. In other words, we shall be reduced to the position of a third-rate Power.

The nuclear energy programme is of much greater importance to us than to the United States. And a most important question is: When can we hope for atomic energy to take over from coal or to supplement it in a worthwhile way? The capital cost of a nuclear power station, in the view of Professor Simon, will at first be of the order of ten times that of conventional power stations. Of course, with increasing experience this figure will come down. However, considering the complexity, of the nuclear power system, 'we can safely say that for the foreseeable future the cost will not be lower than two to three times that of the conventional one.'

Only by the end of the century—and again this is the opinion of Professor Simon, may we expect to have a nuclear electrical system of the same capacity as our present one. By then, however, Britain will be using vastly greater amounts of electricity—if she is still a great industrial Power. Electricity is responsible for only a fraction of our fuel consumption. By the end of the century 'there can be no question of nuclear fuel having taken over from coal. Coal will have to be our mainstay for a long time to come.'

FESTIVAL HALL HEAT PUMP

When the Festival of Britain opened in May, 1951, an experimental heat pump had been installed as an alternative method of heating the Royal Festival Hall. The plant was designed by the Chief Scientist's Division of the Ministry of Fuel and Power primarily to obtain definite data on the cost and practicability of such a plant, and the principles of the design and construction have been described and commented on in the 'GAS JOURNAL.' Particulars of its operation and its performance have now been made available in a paper to the Institute of Fuel by P. E. Montagnon and A. L. Ruckley, both of the Chief Scientist's Division. This most interesting contribution gives an account of the pump through the stages of developing, its various components, and the installation and operation of the plant. It may be recalled that the prime movers for the heat pump were Merlin aircraft engines converted to run on town gas and arranged to drive centrifugal compressors. In point of fact, the development of the engines' compressors and the high-speed rotary sealing units proved to be the most difficult task.

The output of the plant was some 9 mill. B.Th.U. per hour, which proved to be vastly in excess of the requirements of the Festival Hall, in spite of the original estimate that the peak load on the hall would be over 25 mill. B.Th.U. per hour. The cost of the whole project—a matter of over £103,000 was, of course, much in excess of what might be expected for a duplicate of the installation. It would obviously be unfair to base comparisons between this and other methods of heating on the figures relating to the experimental South Bank installation. For example, comparison of the figures with the actual cost of heating the Festival Hall by conventional gas-fired boilers is not reasonable because of the discrepancy between the size of the boiler installation and the heat requirement. An analysis of the performance of the heat pump plant has led to the suggestion that a plant of this type might be installed for a cost of some £52,500 and that it would burn town gas at an effective efficiency on peak load of about 1.25. On this figure of £52,500 the cost per therm per hour works out at £575. The authors point out that the annual charge on this sum is difficult to assess because there is such a wide variation of the 'life' between one component and another. However, on a suggested division of: Engine and compressor units, seven years; refrigerating equipment, 15 years; and the remainder, 30 years; and allowing 4% interest, the annual charge works out at 10% of the capital charge. Then attendance and maintenance charges have to be taken into account, and the total annual charges become £6,400.

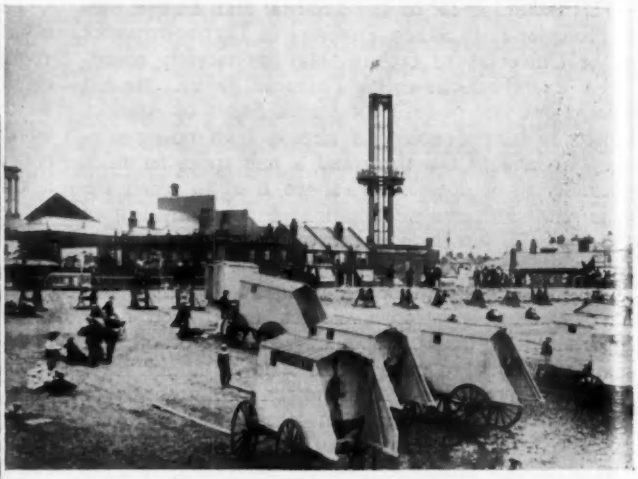
The conclusion is drawn that a favourable overall economic picture for such an installation can be made when summer-time refrigeration is a desirable feature of the building concerned, in which case it is suggested that the heat pump should be designed to have an output based on the refrigerating load rather than the heating load.

BRITISH INDUSTRIES FAIR

'SERVICE TO INDUSTRY' will be the theme of the Gas Council exhibit at the 1954 British Industries Fair at Castle Bromwich from May 3 to May 14. It will stress the breadth and extent of the services which, through the Industrial Gas Development Committee and the industrial gas officers of the various gas boards, the industry can offer to all who have occasion to use gas in factories and workshops. Side by side with this, there will be shown examples of the newest developments in the design of industrial gas appliances. Several of the exhibits are production models, which are being shown at Castle Bromwich for the first time.

A further section will be devoted to demonstrations of how improvements in fuel economy and efficiency can be brought about by good design. There will be three specific demonstrations illustrating this point, devoted respectively to the advantages of insulating refractories; the importance of sound burner design and insulation in tank heating; and of pressure control in larger furnaces, particularly those in which the door has to be opened frequently to insert the work. These exhibits will be fully instrumented so that a clear comparison between the performance of the one design and the other can be seen by visitors to the stand. Among new developments to be shown will be a furnace working at temperatures up to 2,000°C.; a portable mould dryer; a protective device for sterilisers; a small high temperature furnace working up to 1,400°C.; a small ceramic kiln; and a heat treatment furnace. In addition, there will be shown in operation a range of precision burners made by various manufacturers.

GAS AT SOUTHEND ★



The Hope Tavern, now the Hope Hotel, where the Southend Gas Light and Coke Company was formed exactly a hundred years a ago, is shown on the left. Above is a glimpse of Southend beach in the good old times, when bathing machines were fashionable. For the photographs we are indebted to the North Thames Gas Board who, in turn, express acknowledgment in a souv nir brochure to the Southend Standard, Essex Weekly News, Mr. H. Grant and Mr. H. J. Murrell.

ONE hundred years have passed since a few far-seeing men of the little township of Southend-on-Sea met to form the Southend Gas Light and Coke Company, and today (the actual anniversary of the first meeting on January 27, 1854) the people of 'London by the Sea' are celebrating the Centenary. The North Thames Gas Board, of whose area the Southend undertaking forms an important part, has, with the co-operation of the education authority, arranged an essay competition, with two prizes for every school and two major prizes for the Southend district as a whole. The town is gay with posters, in showrooms, on transport vehicles, and in the shops of authorised dealers, and there are prizes for balloon competitions.

The sponsors of the meeting at the Hope Tavern 100 years ago today realised that for a fashionable watering place primitive lighting by lamp and candle would not be good enough; holiday-makers would expect the same gas-lit brilliance in streets and houses that they enjoyed in London. The Company was formed with a capital of £1,500 in 300 shares of £5 each, with Mr. J. G. Payne as Chairman and Mr. J. B. Brasier as Secretary. With commendable public spirit Mr. D. Scratton, the Lord of the Manor, gave the Company free of charge a site of four acres, which forms the nucleus of the present works, and on May 8, 1855, the Company's gas was used for the first time, when 120 gas lights were lit. By the time of the annual meeting on March 5, 1856, there were 340 burners, including some at the London, Tilbury, and Southend Railway station, and the total revenue for the year was £382 18s. 4d.

Rapid development followed. In the Victorian years between 1857 and 1901 the population rose from 8,000 to 28,000, and gas consumers increased from the 340 burners in 1856 to about 5,000 consumers in 1901.

Many old houses were fitted for gas and much new business came from building estates that went up round the outskirts, new building needing new mains, and new mains needing bigger and better plant.

Progress during the first half century was reviewed in interviews which the Company's Engineer, Mr. F. Clark, gave to the *Southend Standard* in 1898 and 1900. The works area had spread from 1½ acres to five, gas output had risen from 11 mill. cu.ft. in 1877 to nearly 100 mill. in 1898, and the staff increased from 14 to 110. In 1902 some 616 cookers were fixed in two months, and in 1896 the pavilion was lit by incandescent gas, burning in the Company's own lanterns and columns.

Mr. Charles Woosnam in 1882 celebrated 28 years as a director by being elected Chairman, a post he

The famous Dolphin Restaurant on Southend Pier uses gas for cooking. To meet the demand for gas on the Pier a 4 in. main has been laid along its full length.

★ 100 YEARS OF SERVICE

Prepayment meter collectors in 1912. Rakish boaters were a company issue. At the wheel of the Opel is Mr. Arthur Smith, who retired last year after 48 years service.

held with conspicuous honour for 19 years, resigning in 1901. He was then re-elected a director and remained until he died in 1906, having served the Company for a total of 52 years.

Between 1900 and 1953 Southend's population leapt from 28,000 to more than 150,000, and consumers increased from about 4,000 to 125,000, partly, it is true, due to a widening of the area of supply as smaller undertakings were absorbed. Prepayment meters proved a tremendous success and soon outnumbered the ordinary, and the prepayment department was motorised in 1906, when a Bradbury tri-car was bought for £100. By 1913 this had been replaced by an Opel which in its first year brought in 5,760,000 pennies, weighing 52 tons, 10 cwt.

While all these developments were progressing on the district, technical progress on the works was keeping pace with demand. The first world war brought about changes in personnel. Mr. F. Clark retired after 32 years of service as Chief Engineer, and was succeeded by Mr. C. S. Shapley (later to become President of the Institution of Gas Engineers), who in turn was followed in 1918 by Mr. T. F. M. Canning. Eventually the Company was amalgamated with the Gas Light and Coke Company in 1932, in which year Mr. J. T. Randall retired after 38 years as Secretary, and Mr. Canning retired after 13 years as Chief Engineer. The last of the leaders of the old Company, Mr. J. H. Burrows, died in 1935.

Today there are 1,100 employees of the North Thames Gas Board in the Southend District, and the annual gas consumption is of the order of 6,000 mill cu.ft. Southend is one of Britain's great seaside resorts with a booming tourist industry, and the gas industry is taking a worthy share in the development of new houses, new hospital extensions, new schools, and new industries. Not the least contribution made by gas is its service to the hotels, restaurants, and shops, for cooking, water heating, and space heating.

On the left is the modern kitchen of the Dolphin Restaurant at the end of Southend Pier. A feature of Southend's development in the last half century has been the building of large new housing estates. The vast majority of the new homes have gas cookers, and gas also has its fair share of the water heating, space heating, and refrigerator loads.

Personal Notes

MR. J. D. C. WOODALL has now been officially appointed Divisional Sales and Service Manager, Kent County Division, South Eastern Gas Board, with effect from January 1. Mr. Woodall has been acting Sales and Service Manager since July, 1953, and was previously Manager of the Maidstone Group.

MR. W. L. JAMES has been appointed Chairman of Mellor Bromley & Co., Ltd. The Board now consists of Mr. W. L. James (Chairman), Mr. R. K. L. Walker, Mr. W. A. Simpson, and Mr. H. B. Cufflin. Mr. James, who is 62, joined Mellor Bromley & Co., Ltd., in 1920, and was made a Director in 1933. On the formation of Pegson, Ltd., in 1932, as a separate member of the group to build mining, quarrying, and road-making plant, he became a director of that company and later, Chairman and Managing Director. In the early days of Pegson, Ltd., Mr. James was responsible for the introduction into this country of specialised American machines, to be manufactured under licence. MR. G. A. HANNAH succeeds Mr. James as Managing Director of Pegson, Ltd. Mr. Hannah joined Mellor Bromley & Co., Ltd., in 1938 as assistant to the works director, and within a few months transferred to Pegson, Ltd., as general works manager. In 1945 he was appointed a director.

MR. L. C. V. HAYWARD, formerly Coal Officer, has been appointed Manager, Coal Department, of the North Thames Gas Board. Other appointments of the Board are: MR. A. SWEET, Assistant Manager, Coal Department; MR. E. ST. JOHN STOW and MR. T. GREEN, Assistants to the Chief Draughtsman; MR. P. R. WHITE, Assistant Solicitor; MR. R. A. SMITH, Assistant to the Commercial Manager (Sales),, and MR. T. STAMPER, Senior Assistant Engineer, Southall.

ARTHUR J. HOLLOWAY, aged 17, apprentice gas fitter, has been awarded the 'William Dieterichs' prize by the North Thames Gas Board as the 'best apprentice' during the past term. At a recent Watson House ceremony he was presented with a set of drawing instruments by Mr. G. C. Holliday, Manager of Watson House. The competition is held each term, and was instituted in memory of the late William Dieterichs, himself a former apprentice with the Board, who became Manager of its research and training centre. The work, conduct, time-keeping, and craftsmanship of each apprentice is taken into account when deciding the winner, who receives a prize for himself and the 'William Dieterichs' Shield, which is displayed in the workshops where he receives his training. Mr. Holloway has been with the Board for 20 months, and is working on their Eastern Division gaining 'district' experience.

NEWTON CHAMBERS APPOINTMENTS

MR. P. J. C. BOVILL, Mr. S. C. TYRRELL, and Mr. K. E. WALKER have been appointed Assistant Managing Directors of Newton Chambers & Co., Ltd., and MR. R. F. A. SAMPSON, a local Director, has been given special responsibilities for London interests.

Mr. Bovill (Chemicals Branch) joined the company in 1922 as assistant manager of the then newly-formed Thorncliffe Coal Distillation, Ltd. Two years later he was appointed assistant manager of the chemicals department, and in 1928 became works and sales manager of the tar distillation works. In 1933 he was appointed joint manager of Coke Oven Products, Ltd. (in which Newton Chambers was a partner), and from there went in 1939 to the Rother Vale Collieries branch of the United Steel Companies as commercial manager of the chemicals department. He returned to Thorncliffe in 1942 as local Director and general manager of the chemicals branch, and was appointed Vice-Chairman of the board of local directors in 1951.

Mr. Tyrrell (Excavator Branch) joined the company in 1940, became Chief Accountant in 1943, and was appointed a local Director in 1945.

Mr. Walker (Engineering Branch, including the heavy constructional department and light castings department) is a new-comer to Thorncliffe. After early experience in chemistry and foundry work he became foundry metallurgist and production engineer in the non-ferrous and die-casting foundries of the English Electric Co., Ltd., at Stafford, and was later appointed manager of the Dick Lane works of the English Electric Co., Ltd., at Bradford.

Mr. Sampson joined the company in 1930 after early training in sales promotion and advertising work at the London headquarters of Electrolux, Ltd., and Safetex Safety Glass, Ltd. On joining Newton Chambers, he specialised originally in export sales, travelling fairly extensively on the Continent, and returned to London in 1933 as export manager. Four years later he went to Thorncliffe on appointment as general sales manager of the chemicals branch. In 1947, he was appointed a local Director with the special responsibility of advising the Managing Director on sales policy.

Above: P. J. C. BOVILL.

Top right: S. C. TYRRELL.

Bottom right: K. E. WALKER.

For each of the three production branches there will be a committee of management, consisting of the Managing Director (Chairman); the appropriate Assistant Managing Director (Vice-Chairman); the appropriate General Manager, and the London local Director.

Obituary

ALDERMAN MRS. M. C. IRVING, of Tottenham, has died in hospital, following an operation. She was until last year Deputy Chairman of the Eastern Gas Consultative Council.

MR. H. P. ALLISON, Manager of the Redcar undertaking of the Northern Gas Board, has died at Redcar at the age of 61. Mr. Allison was Gas Engineer to Redcar Corporation for 27 years before nationalisation.

MR. A. W. DICKINSON, who was employed at the War Office as a fuel technologist, has died in London. Well known in the gas industry, Mr. Dickinson started his career at Croydon 21 years ago, and later joined the United Kingdom Gas Corporation, becoming Industrial Gas Engineer to the former Castleford Group, and later Industrial Gas Engineer to the former West Riding Group. Prior to nationalisation he joined the Ministry of Fuel and Power, Newcastle, before taking up an appointment at the War Office.

Diary

Jan. 28.—MIDLAND JUNIORS: Visit to Parkinson Stove Co., Ltd.

Jan. 28.—INSTITUTE OF FUEL: 'The Coal Problem,' D. Hicks. Gas Showrooms, Nottingham, 6.15 p.m.

Jan. 29.—SCOTTISH JUNIORS (WESTERN): Annual Dance and Buffet. The Ca'doro, Union Street, Glasgow. 7.30 p.m.

Jan. 30.—MANCHESTER JUNIORS: Visit to Blackburn Greenbank Gasworks. 'The Design and Performance of 0.5 mill. cu.ft./day Tully Carburetted Complete Gasification Plant.' G. R. Spence and G. Wheatman, Kendal Group.

Feb. 1.—WEST MIDLANDS G.C.C.: Queen's Hotel, New Street Station, Birmingham. 2.15 p.m.

Feb. 2.—SOUTH EASTERN G.C.C.: Caxton Hall, Westminster, 10.45 a.m.

Feb. 4.—LONDON JUNIORS: Visit to Telcon works.

Feb. 6.—SCOTTISH JUNIORS (EASTERN): 'Maintenance of Mechanical Plant.' G. A. Wood, Edinburgh.

Feb. 6.—YORKSHIRE JUNIORS: 'Accounting at Group Level,' K. L. Pickthall, Group Accountant, Huddersfield/Halifax Group, North Eastern Gas Board. At Harrogate.

Feb. 9.—WALES AND MON. JUNIORS: Short Papers by students J. R. Fisher, J. Sargent, D. Thomas and G. Griffiths. Swansea.

Feb. 9.—MIDLAND JUNIORS: 'Controls and their Application.' W. Bevan-Lewis, Sperryn & Co.

Feb. 11.—NORTH WALES JUNIORS: Visit to John Summers coke oven plant.

Feb. 12.—SCOTTISH JUNIORS (WESTERN): 'Water Gas,' W. F. Cummings, Tradeston.

Feb. 12.—LONDON JUNIORS: 'A District Manager's Impressions in a County Division,' E. J. Hoadley, South Eastern Gas Board, 178, Edgware Road, 6.30 p.m.

Feb. 12.—INSTITUTE OF FUEL: 'Aspects of a National Fuel Policy,' G. Nabarro, M.P. The University, Leeds, 6.30 p.m.

Feb. 16.—LONDON AND SOUTHERN SECTION, I.G.E.: 'The Preparation of Coal for the Gas Industry,' E. M. Myers, National Coal Board.

W-D in 1953 were "on site" building 44 NEW COAL CARBONISING PLANTS with an annual coal carbonising capacity of 6½ million tons.

GAS MAKING PLANTS

	Tons coal/day		Tons coal/day		Tons coal/day
√ Bilston III	86	Edinburgh IV	259	√ Penzance III	42
Boston	96	Edinburgh V	259	Rotherham	617
√ Brighton I	406	Exeter	377	Smethwick III	205
Brighton II	406	Glasgow Tradeston II	179	√ Strandvej, Denmark V	50
Brighton III	406	Greenock II	99	√ Swan Village II	576
Croydon IV	270	Grimsby VI	80	√ Tingley I	511
√ Derby I	380	Irvine III	18	Tingley II	511
Derby II	380	Jersey	190	Tipton II	45
Derby III	380	√ Kensal Green V	336	Tottenham V	557
Dover I	341	√ Lincoln IV	138	Walsall II	821
Dunfermline II	40				

√ Completed and put to work.

The figures following the contract names denote the number of installations built at this Works.

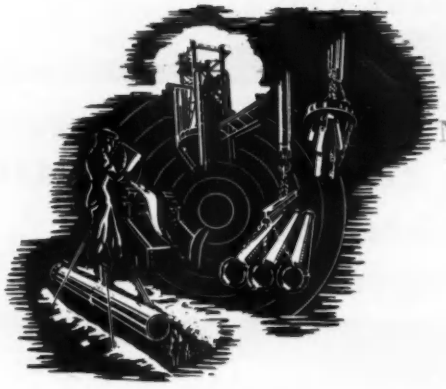
COKE OVENS

	Tons coal/day		Tons coal/day
Avenue, Chesterfield	2175	Lysaght IV	490
Beckton IV	603	√ Monckton, Barnsley III	218
Cardiff IV	963	Moss Bay, Workington III	1159
√ Corby V	371	Orgreave III	858
Ebbw Vale IV	444	Redbourn II	353
Fishburn, Durham	1000	Stanton II	918
√ Irlam III	390		

WOODALL-DUCKHAM

CONSTRUCTION COMPANY LTD.

Woodall-Duckham House, 63-77 Brompton Road, London, S.W.3
Phone: KENsington 6355 (10 lines). Grams: Retortical (Southkens) London.

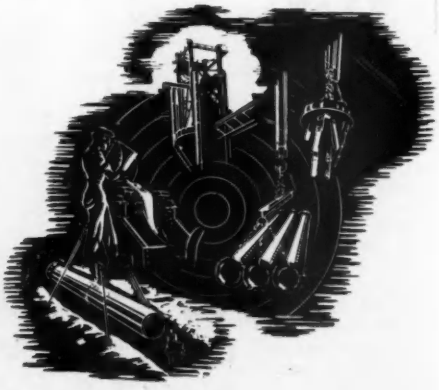


No 4 CONCERNING CAST IRON PIPES

A scene photographed during the laying of a Stanton 9" Spun Iron Pipe main with Screwed-Gland Flexible Joints.

Imperviousness

The methods of manufacture used for Stanton Spun Iron Pipes, Vertically-cast Iron Pipes, and Special Castings, are such as to ensure sound metal free from blowholes, porosity, and similar defects. The value of this is clearly shown by the large mileages of Stanton Pipes used throughout the world.



THE STANTON IRONWORKS COMPANY LIMITED Nr. NOTTINGHAM

Gas in FRANCE—and BELGIUM

—by 'ASHTON'

The situation of the gas industry in Belgium during 1952 is summed up by M. G. Leburton, Chief Engineer to the department of industry and commerce of the Ministry of Economics, in some such words as the following reported in the November-December issue of *Revue Générale du Gaz*, the organ of the Belgian Royal Association of Gas Engineers. 1952, like 1951, was a year of great prosperity for the coal carbonising industries, although the final months indicated some reduction of activity. The quantity of coal treated in coke oven plants reached a new maximum, attaining figures exceeding those of 1950 by 37%. This increase has been achieved by the modernising of existing installations and by advances in the technique of carbonisation. The production of coke has reached such figures that internal demand has been largely satisfied, and exports of coke have sensibly exceeded those of previous years.

Gas production has increased in a similar manner to such an extent that daily and seasonal peaks have been met with the minimum recourse to peak load plant. At the same time it should be mentioned that peak loads have been met to a great extent by the coal industry by the recovery of methane from the mines. The recovery of this gas, which was exhausted to atmosphere as late as 1949, has developed to a surprising degree. The volume of this gas sold reached about 100 mill. cu. m. (say, 3,500 mill. cu.ft.) at 4,250 cal. per cu. m. (445 B.Th.U. per cu.ft.), placing the total from the Belgian collieries in the second position in the means of production serving the public. Part of this gas is treated in a modern cracking plant.

The progressive elimination of gasworks continued. They no longer produce gas at an economic price. The year 1951 saw the starting-up of one installation of propane-air; 1952 saw the establishment of efficacy and value of the new process in one isolated region.

Interlinkage of Distribution

Two projects likely to be of value in the national economy, assuring the security and regularity of gas supply, are in course of study. One was put into commission and work on the other is in progress. Both are in the form of interlinkage of distribution systems. The first is the connection of the Liège system with the German system of Ruhrgas and Thyssengas. On August 18 the first volume of gas coming from Germany was of most valuable assistance to the supply of the eastern regions of Belgium. The second project is the interconnection of Distrigaz and Sargaz by way of the valley of the Meuse and Sambre.

Domestic sales of gas are far from making progress, first because extensions of gas supply are not assured of a remunerative return, and also because the organisation of household work is undergoing a progressive evolution which must result in a diminished individual consumption. On the other hand, serious competitors are appearing on the market in the form of liquified petroleum gases—notably propane and butane. Delivered in bottles, these are penetrating even into areas possessing a gas distribution system. A serious effort will have to be made if town gas is to retain or improve its position. The study of suitable tariffs, of the extension of the market, of the development of supplies, must be undertaken without delay.

Preponderance of the Coke Oven

It must not be forgotten that town gas is a product of the distillation of the country's own resources of coal. There is too much tendency to consider it as a secondary form of energy. It is still far from occupying the position it should logically occupy in the nation's economy.

The feature of Belgian gas supply is the preponderance of the coke oven in the production of town gas as well as of coke. Of the total volume (1,771,564,000 cu. m., say, 62,580 mill. cu.ft.) of coal gas made in 1952,1,706,875 cu.m. (60,000 mill. cu.ft.) was made in coke ovens, of which 685,642,000 cu. m. (24,220 mill. cu.ft.) went to public consumption as against the direct supply of 921,215,000 cu. m. (32,540 mill. cu.ft.) to industry—and as against 12,702,000 cu. m. (448 mill. cu.ft.) made in gasworks. In short, gasworks are playing a minor part in the gas industry of Belgium. There remained only eight gasworks in operation at the end of 1952.

The total quantity of coal carbonised in coke ovens during 1952 was 8,343,306 metric tons, an increase of 37.2% on 1950; the figure for 1951 showed an increase of 30% on 1950. Of this total 55.55% went to steelworks ovens. Gasworks took only 27.733 tonnes in 1952, a decrease of 7.2% on the previous year.

The growing importance of the coke oven is also seen in the figures for gas production. In 1950 gas produced in coke ovens represented 84.1% of the total made. In 1951 it reached 92.9% and in 1952 96.4%.

The explanation of this situation is that coke ovens have pushed their production to the maximum to satisfy the needs for coke. This activity has entailed an increase in the production of gas which has satisfied the demand without any great recourse to peak load plants and other methods of production.

At the same time it is interesting to note the contribution to gas supply made by the recovery of methane from the coal mines, which have delivered 84,506,000 cu. m. (3 mill. cu.ft.) of methane to public supply, a very big increase since the beginning of 1950.

The report is complete with many interesting graphs and statistics.

The November issue of the *Journal des Usines à Gaz* carries a brief introduction to the Gas Institution's Report on American practice with a translation of the recommendations in full. The Editor remarks on the work which is being done in Britain on the structure and production of coke and calls attention to the parallel activities in France, particularly in the employment of Sarre and Lorrain coals.

He calls attention, too, to the propaganda activities of the Gas Council. 'Everyone knows,' he says, 'the little symbolic puppet, (le petit pantin) Mr. Therm, brother of him whom we call in France, Gazinet or Cokinet according as he represents gas or coke. Dressed in gloves and shorts, he is presented, this time, in the role of a champion in the noble art with the legend, "Mr. Therm knocks out the murderer, Fog"—And "Mr. Therm makes the best use of the nation's coal".'

The Incidence of Mine Subsidence

At a national conference on Safety held in Paris in June, 1952, MM. Malherbe (Director of carbonisation and gas of the coalfields of the North and the Pas de Calais) and Condeville (Joint Chief of the St Etienne centre of distribution) discussed the effect of mine subsidence on distribution mains. They find that, generally, the effect of a subsidence extends over an area at the surface extending beyond that at the mine level at an angle of 15° to the vertical. The effect on mains laid near the surface is one of extension at the centre but it may be one of compression towards the sides. In fact the effects and their extension are always very complex, affected by the nature of the over-burden, of faults, etc.

Steps taken to deal with this problem, related mainly to steel mains, are described in detail. Steel tubes with welded joints have the advantage of continuity and lightness but they do not permit of compensation from tube to tube; a certain suppleness is advisable. The use of the double socket coupling is the most obvious means of

securing this. A fairly long sleeve coupling is inserted between two lengths of main, the two ends being laid well in when extension is expected and just in when the reverse is anticipated. Several inches of relative movement may be allowed for in this way. Recent developments of this joint and details of 'corrugated' joints are described and discussed.

Town Gas for Art Pottery

Vallauris (pronounced—loriss), a little town lying between Cannes and Nice, though of no more than 8,250 inhabitants, has become one of the most active centres of art pottery in France. The pottery industry in this region is ancient, but after a period of prosperity in the early years of the century, pottery in Vallauris was languishing when in about 1923 Picasso established himself in the region and 'discovered at the same time in ceramics a new material for the expression of his genius.' He attracted just before the last war a group of artists resulting in a very considerable improvement in the appreciation of Vallauris pottery. Quality, originality, and artistic character became the properties in demand and production tended almost exclusively towards the *object d'art* and the *pièce unique*.

Formerly wood was used for heating the biscuit. Latterly electricity was tried, but town gas now appears to have established itself as the most flexible, convenient, and economical fuel. Gaz de France produced a special intermittent furnace with recuperation and atmospheric burners, to which we have already referred. Those at Vallauris are described with a drawing and photographs by M. Prèvot, Chief of Industrial Physics in the Research Department of Gaz de France, and M. J. Chardenet of the Distribution Department of Nice. Three furnaces are already in service and two others are on order. The average monthly consumption of gas will be about 70,000 cu.ft.

The 71st Congress of the Gas Industry will be held in Paris, in the week June 21-26, 1954. This is announced in the November issue of the *Journal des Usines à Gaz*.

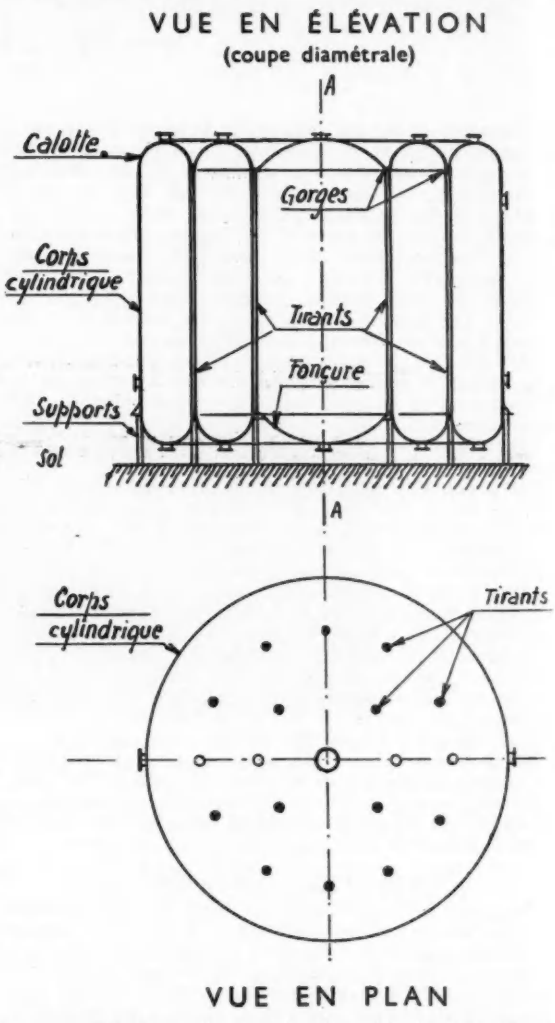
Also in the same issue it is announced that in order to exchange views on the best methods in use in their several works, the engineers of colliery coke-oven plants, steelworks, and gasworks have decided to meet periodically. At one of these reunions held on April 21, 1953, at Marienau, on the initiative of the Collieries of Lorrain, it was agreed that Gaz de France would organise the next. This took place in Paris on October 22, 1953. The next is provisionally fixed for February 23, 1954, on the initiative of the Lorrain steel industry.

The subjects discussed in October were, a report on the carbonising tests of Sarre-Lorrain coals, problems of interchangeability of gases in the gas industry, and disposal of effluent from coke oven plant. Visits were paid to the coke oven plant at Gennevilliers and le Villeneuve-la-Garenne, both operated by Gaz de France.

Pressure District Holder

In the December issue of the French *Journal*, M. A. Dubault, Chief Engineer (Distribution) Saint-Brieuc, in the Western Division, describes a novel construction of a pressure district gasholder at Perros-Guirec. The vessel is 15.5 m. in diameter, 11.55 m. high overall, with a water capacity of 2,000 m. cu. in. (70,000 cu.ft.) designed to hold a maximum of 3,000 cu. m. at a pressure of about 1½ atm. The sides of the vessel are in the form of a cylinder but the crown and base are in the form of two concentric rings with convex ends surrounding a central ring with convex ends. These rings are tied top and bottom by vertical tension members at the base of the 'ondulations.' A certain number of the tie rods are in the form of tubes to drain water from the troughs of the holder top. The idea is shown in the sketch reproduced. The metal used is stated to be 'a semi-inoxidisable steel, resisting weather and saline air better than ordinary steel.' Details of purging and control are given in the article.

This year is the jubilee of the Meker burner; and we join with our French contemporary in congratulating M. Meker on this occasion and in its wishes that he may long continue to preside over the Company, Etablissements G. Meker et Cie, which still operates under his personal direction. At an early public demonstration in 1904, it is recorded that Professor d'Arsonval remarked to the inventor 'What a funny idea to wish to improve on the burner of Father Bunsen!' The part which the Meker burner has played and continues to play in the industrial applications of gas is, of course, well-known.



Gas in France in 1952

The Annual Report of Gaz de France for 1952 is just published. It is summarised in the December issue of the *Journal des Usines à Gaz*. Apart from a slight recession in 1950 sales of gas have continued to increase, reaching the equivalent of 2,730 mill. cu. m. at 4,200 cal. (95,436 mill. cu.ft. at 440 B.Th.U.) of which 1,813 mill. went to domestic consumers and 917 to industrial and commercial users. The number of consumers now exceeds 5 mill. and the average sale per consumer is 540 cu. m. (19,000 cu.ft.).

During 1952 the quantity of coal treated was 4,991,000 tonnes, an increase of 4.6% on 1951. The yield increased from 485 to 487 cu. m. per tonne (17,400 to 17,475 cu.ft. per ton) and the weight of coke available for sale from 524 to 532 kg. per tonne—*i.e.*, 52.4% to 53.2% by weight of coal carbonised.

1952 was the first year of financial autonomy enjoyed by Gaz de France, but the price of gas, blocked by the Decree of March 28, 1952, did not vary during the year, the publication of the 'gas index' having been suspended since November, 1951. In spite of that, receipts from the sale of gas, excluding taxes, increased by 22%.

NEW CARBONISING PROCESSES

By D. T. BARRITT and T. KENNAWAY

(*Concluded from p. 155*)

BRENNSTOFF-TECHNIK PROCESS

It is well known that the coke from weakly caking coals can be improved by the use of narrow ovens working at high coking speeds, by the increase in density of the charge, and by the addition of pitch to the blend. For example, a coke oven plant with narrow ovens in the U.S.A. carbonising Utah coal of 38% volatile matter and 10.5% oxygen content gave a blast-furnace coke yield (over ¼ in.) of only 50.44% when the oven charge density was 45 lb. per cu.ft. and the mean flue temperatures 1,148°C. The addition of 4% pitch, the raising of the flue temperatures to 1,204°C., and the alteration of the grinding of the coal to raise the bulk density of the charge to 49 lb. per cu.ft., increased the blast-furnace coke yield to 59.04%, an improvement of 17% on blast-furnace-coke production.

Operators of British coke ovens carbonising high-volatile Derbyshire and Staffordshire coals will also be familiar with the fact that high coking speeds give improved yields of coke. The Brennstoff-Technik process is an application of the principle that plasticity increases with increase in rate of temperature rise, in that high heating rates are employed. High flue temperatures, however, are avoided by the use of very narrow chambers. It is possible to carbonise weakly caking coal with high rates of heating, and the Brennstoff-Technik process in this respect is a logical development.

Development Stages

The following fundamental ideas have therefore been taken into account in the development of the Brennstoff-Technik process:—

(1) High rates of heating have been achieved by using chambers made of iron instead of silica brick, the thermal conductivity of iron being about 20 times that of silica. Much lower flue temperatures are therefore possible. Iron chambers can be made very narrow, the usual widths being 60 to 125 mm. according to the nature of the coal coked. This metal construction has proved satisfactory over a period of years.

(2) The weaker the caking properties of the coal, the narrower the chamber width used. For example, a coal which would not give a satisfactorily coherent coke in chambers 80 mm. wide has been found to produce an improved product in chambers 60 mm. wide.

(3) To be economic in Germany, where the process is being developed, it must be used on high-volatile coals to give as high a yield of tar as possible. For this reason it is desirable not to take the carbonising temperature any higher than is necessary to produce satisfactory coke.

(4) In consequence, carbonisation is completed at temperatures not exceeding 650°C., at which figure the coke has not begun to shrink sufficiently to discharge freely. The heating walls are therefore pivoted at the top so that they can be swung apart at the base to allow the coke to drop out.

(5) It is recognised that uniformity of heating is vital in the successful coking of weakly caking coals. It is achieved in the Brennstoff-Technik (B.-T.) process by burning the heating gas in an external combustion chamber and circulating the hot products through the heating walls.

A battery of B.-T. ovens is made up of a number of blocks of ovens, each block containing usually 12 chambers all charged simultaneously from a multiple-hopper car drawing coal from a central service bunker. Each chamber holds a charge of about 1 ton and has a coking time of approximately 2 hours when the charge is briquetted or up to 4 hours when fine coal is used. The coke after carbonisation is dropped into a coke car, conveyed to a quenching tower, and then, after quenching, discharged to a wharf in much the same manner as in coke oven practice.

The gas supplied to the burner in the combustion chamber is automatically controlled by the temperature of the circulating gases to maintain the walls at a steady temperature.

Results from the Process

(1) As in the National Fuels process, it is possible with the B.-T. process to carbonise high-volatile weakly-caking coal which cannot be carbonised in coke ovens. In this case, however, it is not necessary to pretreat the coal by oxidation, nor is it essential to make briquettes. The raw coal can be charged in nut form or as fine coal. Coals from Upper Silesia, the Ruhr, the Saar, and Lorraine, have been treated successfully. A plant is already in operation at Marienau, in the Saar, producing 154 tons of coke per day.

(2) The B.-T. process is flexible. It can be started up or shut down at short notice and without risk of damage.

(3) The yield of tar is high, but only a relatively small quantity of gas is produced.

(4) The chambers are discharged by allowing the coke to fall from them into a coke car which runs beneath the ovens. A ram machine and coke guide are therefore unnecessary. There is no regenerator system, although provision is made for the ingoing air to be preheated by the waste gases which are bled to the chimney. These features all simplify the construction of the oven, with a corresponding decrease in capital cost.

(5) The process appears to be limited to weakly-caking coals and to the production of a low temperature product. If a high temperature product is required, the further complication of a second and external stage of heating is necessary. It is not yet clear whether this additional step has progressed beyond the experimental stage. Another use for the low temperature product is for blending with high-volatile coal to the extent of 10-15% to produce a charge suitable for coking in coke ovens.

(6) The charging and discharging of the retorts are intermittent and must inevitably be accompanied by the emission of some smoke and dust, although, because of the lower wall temperatures, the former at least will not be so severe as in coke ovens.

TABLE 2.—PRODUCT YIELDS, B.-T. PROCESS

	Yield per ton of dry coal
Coke, cwt.	15
Tar, gal.	19.7
Benzine, gal.	2.6
Ammonia, lb.	2.2
Gas (total), cu. ft. at S.T.P.	4,550
Calorific value, B.Th.U. per cu. ft. at S.T.P. (gross)	€80 to 730

(7) Yields as quoted in Table 2 are claimed on weakly-caking coal having a volatile content of about 30%.

(8) After the heating requirements of the retorts and coal driers have been met, the surplus gas available for other purposes amounts only to 7-8 therms per ton of coal processed, as compared with 35-40 therms obtainable from coke ovens on similar coal. The process must therefore be regarded as a producer of primary tars and smokeless fuel capable of burning freely in the domestic open fire. The main attraction of such a process in this country would be for supplying domestic coke.

BAUMCO PROCESS

In the National Fuels process great care is taken with the design of the retort in order to control the heating rate of the briquettes through the critical range. In the Baumco process this problem is dealt with in a different way. The coal which it is desired to make into carbonised briquettes is first heated to 800°C. in a devolatiliser to produce a char which has no coking properties. It acts as an inert and rigid base for the raw briquettes, which are

formed from a blend of char with pitch and coking coal. The former acts as a binder for the raw briquette when it is cold, the latter as a binder for the carbonised briquette in that in the coking process its liquefaction and subsequent solidification cement the char particles together. The result is that if the proportions of pitch and coking coal are correctly determined, the briquettes will not soften when the coking-coal binder passes through its critical range and the rate of heating can be rapid. The briquettes can thus be charged into a retort in which they meet hot gases at 1,200°C. and a high rate of throughput is achieved. As in the Brennstoff-Technik process, the high rate of temperature rise results in an extension of the plastic range of the coal binder and the formation of an adequate plastic zone without pre-distillation.

Wide Availability

The process is applicable to coals of very low caking power (probably having a swelling number not greater than 1), to non-coking coals, and to lignites; it is a two-stage process and necessitates the blending of up to 10% of coking coal between the first and second stages.

In the first stage, the non-coking coal, having a size range 0 to 3 mm. and with a free moisture content not exceeding 12% to 15%, is subject to a low temperature distillation in a mechanical furnace. The Büttner or Hereschoff type of furnace, the temperature range across which is from 700°C. at the inlet to 300°C. at the outlet, is suitable for processing lignites or brown coals. Partial devolatilisation is effected with the production of semi-coke in powdered form. The devolatiliser consists of a number of circular plates on which the coal is thinly spread; the coal drops from plate to plate, the hot gases flowing laterally across the plates. For bituminous coals fluidised devolatilisation is preferable.

Blending and Briquetting

The semi-coke is then blended with up to 10% of coking coal (the actual percentage of coking coal depending on its swelling number) and up to 10% of pitch obtained from the by-product plant.

The mixture of semi-coke, coking coal, and pitch is then briquetted and the raw briquettes are sent forward to the second stage. In this stage the briquettes flow continuously downwards through a vertical shaft chamber which is surrounded by the heating-flue system. Gas from the process is burnt under controlled conditions in this flue system, which is arranged so that the hot combustion gases also flow horizontally through the shaft containing the briquettes, and circulate freely among them. Complete carbonisation is thus effected by both indirect and direct heating. The lower section of the coking chamber is used as a quenching compartment to cool the briquettes by the injection of cold gas from the by-product plant in a somewhat similar manner to the National Fuels system.

The gas leaving the carbonising chamber at 700°C. to 800°C. passes through the devolatiliser where it is used to provide the heat for making the char.

The retort gas and that obtained from the devolatiliser are dealt with together in a dust catcher and by-product plant where the sensible heat remaining in the gases is used to distil the tar produced in the process into a light-oil fraction and pitch. The latter is used for briquetting. By controlling the distillation process, the correct quality of pitch is obtained. The gas is subsequently cooled and washed for benzole. No ammonia (or at least an insignificant quantity) is produced.

In this, the simplest arrangement of the process, the gas produced is high in volume, but has a calorific value of the order of only 140 B.Th.U. per cu.ft.

By introducing preheating systems for the combustion gases or by the inclusion of recuperators which may be fired by producer gas, gas with a calorific value of 500 B.Th.U. per cu.ft. can be produced.

Actual operating data on this process are scanty since the first commercial plant has not yet been completed, but from the results of the work so far available it is possible to assess it in a general way as follows:—

(1) As in the National Fuels (N.F.C.) process, the Baumco system is designed to make a carbonised ovoid. Whereas in the former, however, a weakly-caking coal only is needed, in the latter a proportion of coking coal is essential to raise the coking properties of the mix to the point where it will coke in the highly compressed briquette form. In Britain this would not be objectionable, as the proportion of coking coal needed is small. In certain overseas countries, however, where coking coals are either scarce or non-existent, the use of the process would be restricted, though in certain cases pitch alone can be used as a binder.

(2) The pitch made in the process is sufficient in quantity and suitable in quality for use as the binder for the char and coking coal.

(3) The product is strong, dense, uniform in size, and, as in the N.F.C. process, is capable of variation in its residual volatile matter by adjustment of the internal heating gas volume. Production of a fuel suitable for the metallurgical, industrial, or domestic market is therefore feasible, although the product would most probably not be suitable for the open domestic fire with a shallow bed.

(4) The process is continuous and if well engineered should be free from much of the arduous work, smoke, heat, and dirt inseparable from intermittent processes. Furthermore, it can, as in the N.F.C. system, be shut down, restarted and kept in a standby condition when required and without risk.

(5) A two-stage process such as this, in which the stages have to be synchronised is, of course, a complication as compared with normal coke oven procedure and also requires that the material shall be handled twice. On the other hand, unless the coal initially happens to possess the precise coking properties enabling it to be briquetted and carbonised as it is (a remote possibility), some form of pretreatment is essential. In the N.F.C. process this treatment is by fine grinding, drying, and oxidation. It could be argued that the Baumco method of charging and mixing back a small amount of coking coal is not a much more complicated method of preparing the raw material for briquetting.

(6) The surplus gas from the Baumco process is of low calorific value, usually in the region of 140 B.Th.U. per cu.ft. For town gas supply purposes, its application is very limited. However, by using external preheaters for the fuel gas and combustion air the calorific value of the surplus gas can be raised to approximately 500 B.Th.U. per cu.ft.

(7) No actual figures of heat consumption are available, but on theoretical grounds the Baumco system should be thermally efficient. An estimate of the quantity of underfiring gas is given in Table 3. The briquettes are dry-quenched by cold gas, which is subsequently used to supply part of the heat for coking. The gases from the retort are used to supply the heat for the devolatilisation step,

TABLE 3.—YIELDS FROM 1 TON OF DRY HIGH-VOLATILE BITUMINOUS COAL (Blended with 9% coking coal and 9% pitch).

Gas volume (cu. ft. at S.T.P.):—	
Total	37,400
Heating gas	12,800
Surplus gas	24,600
Calorific value, B.Th.U. per cu. ft. at S.T.P. (gross)	140
Coke, cwt.	14.4
Tar and pitch, cwt.	2.98
Oil, gal.	10.3

and the remaining heat in the gases issuing from the devolatiliser is used to distil the tar from which the pitch used in the briquetting process is made.

(8) The time required for the coal and briquettes to pass through the devolatiliser and retort respectively is one hour for each stage. The capacity of the units is therefore high and the capital cost of the plant could be expected to be reasonably low. It is claimed that it would be 25% less than that of a by-product coke plant of equivalent capacity. Experience only would indicate the scale of operation and maintenance costs, but they would undoubtedly be higher than those normally applicable to a coke oven plant.

It is well known that a plant for the large-scale production of carbonised briquettes has been in successful commercial operation in this country for many years. The product, which is made from a non-coking coal in the

low-volatile range, commands a ready sale as a substitute for anthracite for use in closed domestic appliances and in open fireplaces of the overnight-burning type. The fuel is dense, low in ash, and smokeless.

Unfortunately, the process is confined to a very narrow range of coals and the contribution it can make to Britain's fuel problems is therefore limited. In the processes described in the foregoing, serious attempts are made to widen this range in order to cover in particular the weakly-coking coals which occur so abundantly and which cannot by themselves be used for coke making in orthodox plant. A successful process offering such extended facilities would be of the most profound significance. In Britain, it would enable much-needed supplies of smokeless domestic fuel to be made available and would encourage the installation of modern, economical, clean household appliances, greatly to the benefit of urban atmospheres. In all countries, and especially in those having a growing metallurgical industry but little coking coal, it would offer a substitute for blast-furnace and foundry coke as well.

NORTHERN JUNIOR GAS ASSOCIATION

Short Papers submitted for the Arthur Clement Hovey Medal and presented at a meeting of the Association at Durham on December 11, 1953.

A WELLPOINT DEWATERING INSTALLATION

By J. BROWN, Newcastle-on-Tyne.

THE morning ritual of baling out excavations is a common sight in foundation work. This work is usually necessitated by surface drainage, or sub-soil drainage, into the pit or trench, or by the excavation acting as a direct receptacle for rain. This water is a nuisance more than a problem. When, however, work has to be carried out against a constant head of water and in strata that develop unstable characteristics in the presence of that water, then the proposition becomes one of major importance. It was under such conditions, at the Redheugh works of the Newcastle Division, that a coal breaker pit and coke skip hoist pit, both of reinforced concrete, had to be constructed.

The high ground water level and presence of running sand meant construction difficulties, increased costs, and danger to adjacent buildings. The excessive cost of interlocking steel piles, together with known difficulties and others which might have been encountered in the ties of the piles being driven, led us to investigate the possibilities of an alternative method of approach—that of dewatering. This system removes the ground water prior to the start of excavation. The condition of the running sand is thus altered. The strata are stabilised and the work is carried out in firm dry ground. After consultations with the foundation contractors and a review of the economics of the situation, preparations were made for the installation of a wellpoint dewatering system.

The Dewatering System Described

The equipment consists of a series of wellpoints which are jetted into the ground by water pressure. These wellpoints are connected by riser pipes to a header main and wellpoint suction pump. The ground water is then drawn under vacuum through the wellpoints and pump, and discharged at some point sufficiently distant to ensure its non-return to the site. The type of ground and quantity of water to be handled dictates the number and spacing of the wellpoints. The wellpoint is a fluted steel tube wrapped with a gauze screen and fitted with a shoe, the point of which incorporates a device for jetting. All water under suction must pass through the gauze screen, down the flutes, and through holes to the centre of the wellpoint, and thence up the wrought iron riser pipe. The riser pipes, which are delivered in lengths suitable for the particular site requirements, connect the wellpoint to a swing through a swing joint. Each swing is fitted with a union and stop cock, so that any wellpoint may be disconnected from the header pipe without affecting the balance of the system.

The header pipe is usually supplied in 20 ft. sections and is of 6 in. diameter lightweight steel tube. Bosses for the swing connections are at 2 ft. 6 in. centres—those not required during operation being suitably plugged. The whole, when assembled, gives the necessary flexibility for the positioning of the wellpoints under site conditions. Couplings on the header pipe are of the rubber sleeved type making for air-tight, simple, and speedy assembly. All the header pipe fittings and gate valves have plain ends so that this type of joint can be used throughout. The wellpoint suction pump is a self priming centrifugal, and is combined with a highly efficient air extraction vacuum pump. The latter is essential to cope with large quantities of fresh air which arise from air in the ground water, in the ground itself, and from possible leaks in the long suction lines.

Labour Requirements

The water pressures required for jetting depend on the type of ground and vary from 150 lb. per sq. in. for large gravel to 20 lb. per sq. in. and less for running sand. The higher water pressures can be obtained from a hydrant or jetting pump, while for those up to 20 lb. per sq. in. there is a connection fitted to the delivery of the wellpoint suction pump. To jet a wellpoint into the ground, the wellpoint with riser pipe attached is connected by an armoured hose to the jetting supply. The wellpoint is then placed in the required position and the water pressure turned on. The force of water discharged at the tip of the wellpoint washes a hole in the soil and sinks the wellpoint to the required depth. The jetting supply is then turned off, the hose disconnected, and the riser pipe linked to the header pipe through the swing connection. This procedure is carried out until all the required wellpoints are positioned. When running sand contains fine silt the wellpoints are 'sanded in.' This entails surrounding the wellpoint and riser pipe with coarse grit sand.

Four men can handle the jetting and sanding-in of the wellpoints. Once the installation is complete the only labour requirement is that of one man per shift to take charge of the pumps. The pumps must operate continuously without break until construction work to original ground water level is complete, and any structural concrete is sufficiently matured to withstand the original ground water pressure.

Wellpoints will only operate in ground that permits the percolation of water. Gravels and running sand are ideal. Clay is unsuitable. Clay, however, can be penetrated by jetting and the wellpoint operated successfully in suitable strata below. Wellpoints will not be effective in rock or among boulders with an absence of sand, and where jetting is impossible. Sand below rock can be dewatered by first boring through the rock. Perfectly dry conditions will be achieved only if the material being dewatered exists below the lowest level of the proposed excavation. If, however, running sand exists above clay and the excavation is founded in the clay, then dewatering of the sand will only be complete to within about 6 in. of the clay. This was the position with both the coal crusher pit and the coke skip hoist pit, and some seepage at clay level was therefore to be expected.

It was estimated that the simultaneous construction of both pits would effect an economy. The layout aimed at the dewatering of an area containing both pits. It was further decided that to reduce plant hire time to a mini-

mum it would be advantageous to authorise overtime and week-end work throughout the period of dewatering. The layout consisted of a ring header main, with wellpoints at 5 ft. centres, and two 30 H.P. electrically-driven well-point suction pumps. Each pump was capable of dealing with 52,000 gal. per hour against a 40-ft. head. The header pipe and pumps were to be at ground level; and to dewater to the clay level a lift of about 24 ft. was required. In case of power failure or pump failure a standby diesel-operated pump was provided. Although two pumps were in circuit it was expected that once the water level had been reduced to the clay level only one pump would be necessary to maintain this condition.

Under the terms of the contract the Northern Gas Board had to supply power points for the electric pumps and arrange for the suitable disposal of the discharge water. All labour for the installation of equipment apart from one trained operator had also to be provided.

MAINTENANCE OF GASWORKS PLANT

By C. H. THOMPSON, Redheugh Gasworks.

GREATER mechanisation reduces operational labour requirements; it also increases the volume of mechanical equipment to be maintained. The output figures increase, but only so long as the engineering department maintains the equipment in an efficient state. Production becomes eevn more dependent on this department, which I contend is the production department of any works. Correct administration and properly applied maintenance of the works is the backbone of the gas industry. Economical production depends largely on efficient and energetic maintenance; and the heart of the maintenance structure is the machine shop. As such, this should be adequately equipped.

The Question of Personnel

The number of tradesmen employed in the engineering department should, of course, be consistent with the size of plant and its condition. The question of 'properly applied' maintenance then arises, and in my opinion there are only two methods of application:—

(a) Where fitters are employed on a roving commission. With this method, a fitter is required to repair a pump today, an elevator tomorrow, and so on. The pump will probably require further attention a few days later, but it does not follow that the same fitter will follow up on that unit. Jobs are allocated as they occur, and there is no real basis for regular inspection of all units.

(b) Where fitters have a particular section of plant to maintain. Selecting a fitter to maintain a particular section of plant, gives the man a definite responsibility, affords him the opportunity to become well acquainted with that section, develops a systematic routine of inspection, and gives him first-hand detailed knowledge of that section. Efficiency increases and breakdowns become more infrequent. This method allows the tradesman a place of real importance in the maintenance structure and encourages interest and pride in his work. The results of his efforts and skill are reflected in the efficiency of his section.

Value of Inspection

Regular inspection of plant is a necessary feature of 'properly applied' maintenance routine. Bearings, shafting, gears, couplings, ropes, driving belts, safety mechanism, structures, etc., may be given daily inspection, whereas internal inspection of engines, pumps, gear boxes and the like, which in many cases are running under full load conditions, can only be applied as opportunity occurs, or if arrangements can be made for temporary shut-down of the unit. It is by inspection that defects are recognised and rectified *before* failure occurs.

Reports can be of valuable assistance, particularly with 'sectional maintenance'. A weekly report sheet from a sectional maintenance fitter will convey that certain defects have been observed, and these defects either been made good, or, due to various circumstances, have had to await suitable opportunity for repair. The report may also give indication of wear and tear, very useful in assessing the life of a unit or part of a unit, and therefore in making provision for spare components.

Availability of Spares

From such reports it is possible to assess the types and quantities of spares which should be carried to maintain the plant in an efficient state. Allowance should always be made, however, for sudden breakdown. For example, faults in materials, fatigue, accidents, and so on, may cause sudden failure of a unit. Generally speaking, essential spares and their quantity may be reasonably assessed and should be maintained at a definite level.

Records are a useful instrument of maintenance. All units driven by steam engines may have the running hours recorded day by day so that lubricating oil may be changed at regular intervals. The running hours can also be the basis for internal inspection and overhaul. The suggestion 'If it's running alright leave it alone,' is not logical.

Again, the total running capacity of conveyors can be represented in graphic form. A basis of ton/miles will provide a means of checking the life of a belt or chain, from which spare belt, chain, links, and pins, etc., may be assessed. Eliminating the 'rough guess' or 'hit and miss' principle should be the aim.

One object of good maintenance is to avoid waste. A common example is steam waste. This can take a number of forms, but the more obvious ones are unlagged mains and heating surfaces, leaking joints and valves, and faulty trapping. The following figures refer to steam pressure of 100 lb. per sq. in. (dry saturated).

Radiation losses due to uncovered surfaces.—One sq. ft. of unlagged steam heated surface will radiate a loss of 820 B.Th.U. per hour, equivalent to 1 lb. of steam per hour. Consider, for example, 100 sq. ft. of unlagged steam mains, made up of 66 ft. of 6 in. dia. This amounts to a radiation loss of 100 lb. steam per hour, or 873,600 lb. of steam in one year. With an evaporation figure of, say, 6.5 lb. steam per lb. fuel, then the fuel wasted in one year would be 60 tons. At a cost of 42s. per ton this constitutes a waste of £126.

Losses through leaks in joints, valves, etc.—A ½-in. dia. hole will pass 2.131 lb. of steam to atmosphere per hour, i.e., a loss of 18,659 lb. of steam per year, or 1.3 tons of fuel per year, equivalent to £2 14s. per year. If we take a conservative average of ten similar leaks, then the losses are 186,590 lb. of steam per year, 13.0 tons fuel per year, equivalent to a fuel cost of £27.

A 63 B.H.P. double-acting, single-cylinder, reciprocating steam engine, driving a 300,000 cu.ft. per hour gas exhauster, is estimated to consume 2,205 lb. of steam per hour on full load. Hence the amount of 186,590 lb. steam to waste through leaks would otherwise have kept this engine running for 85 hours, or 3½ days. Losses through unlagged mains would have kept this engine running for a further 396 hours, or 16½ days. The importance of avoiding waste cannot be stressed too strongly.

COKE OVEN GAS MAINS

By S. A. TAIT, Bishop Auckland.

FEW gas boards are more dependent on coke oven gas supplies than is the Northern Gas Board. Of the gas distributed by the Board 50% is derived from coke oven plant. The corresponding figure for the whole country is approximately 12%. The maintenance of coke oven gas transmission mains is therefore of particular importance in this area.

In 1937, agreements were entered into by the Darlington, Bishop Auckland, and Spennymoor undertakings to take a bulk supply of crude coke oven gas to be supplied by Straker and Love from their Brancepeth coke ovens. A 12-in. cast iron main was laid between the Brancepeth ovens and the Darlington works, and two 6-in. branches were taken from this 12-in. main—one to supply the Bishop Auckland works and the other to supply the Spennymoor works. At the outset the capacity of these mains was well in excess of requirements and it was never necessary for full pressure to be maintained at Brancepeth

to deliver the quantity of gas required by the three undertakings.

In the years that followed considerable increases in output of gas occurred at all three undertakings. Furthermore the condition of the mains gradually deteriorated due to the building up of deposits in the 12-in. main and in the two 6-in. branches. The composition of the deposits removed from the 12-in. main varied considerably. Those deposits formed in the first few miles of main contained a high percentage of moisture, organic matter, and iron oxide, with only a small percentage of sulphur. Deposits removed further along the main contained a progressively higher percentage of sulphur and a lower percentage of moisture, organic matter, and iron oxide. In the last few miles of mains the deposit was almost entirely sulphur (85%) and ferric ferrocyanide (15%) with only traces of moisture and organic matter.

The sulphur was apparently formed by the decomposition of the hydrogen sulphide present in the crude gas, and it is interesting to note that the H_2S content of the gas reaching the various works was measurably less than the H_2S content of the gas leaving the Brancepeth ovens.

The increased demand for gas, coupled with the reduction in the capacity of the main, eventually led to difficulties, particularly at Bishop Auckland, where conditions were aggravated by the shortage of holder capacity. The maximum output from the Bishop Auckland works was in excess of 1.6 mill. cu.ft. per day. Total holder storage capacity was 500,000 cu.ft., but the effective storage capacity amounted to only 34,000 cu.ft., since it was impossible to utilise the top lift of one holder without reducing district pressures.

It was necessary, under these conditions, to vary the intake of gas into the Bishop Auckland works by taking as much gas as possible during peak hours. During the winter of 1952-53 the difficulty in obtaining adequate supplies of gas was so acute that it was decided to investigate the condition of the 6-in. main supplying the Bishop Auckland works, with the object of increasing the rate of gas flow carried by the main.

Bishop Auckland Main

The 6-in. branch main was tested as a whole, the pressure at the branch on the 12-in. main being recorded together with the terminal pressure at the works. The actual rate of gas flow was obtained from the station meter records. The pressures, etc., were then substituted in Lacey's high pressure formula to obtain the theoretical rate of gas flow. The actual rate of flow was compared with the calculated flow and the 'efficiency of transmission factor' obtained. This figure was more or less independent of varying initial pressures and flow rates.

During the previous winter, when only minor difficulties had been encountered, it was found that the efficiency of transmission had been 84%-87%. Further tests gave the following results: November 17, 1952, 77% efficiency of transmission; December 7, 1952, 65%; December 22, 1952, 60%.

Immediate steps were taken to check pressures at all syphons along the route of the 2,700-yard main. These indicated a sharp pressure drop between two syphons some 400 yards apart which were separated by rising ground. This section was then sub-divided into equal lengths, and test points were inserted using an under-pressure drilling and tapping machine. By repeated testing, and narrowing the distance between test points, it was possible to determine that a major stoppage existed in a single pipe.

Since the pipes were fitted with screwed gland mechanical joints, it was simple to remove this pipe and two other pipes at each side of it. It was found that the pipe was almost completely blocked for a distance of approximately 2 ft. In the other pipes there was a layer of deposit with a maximum thickness of ½ in.

The pipes were replaced and the gas supply was turned on again. Water could be heard surging backwards and forwards in the main. This surge of water, travelling at speeds of up to 60 M.P.H., had no doubt broken up the original layer of deposit in the main, and this in turn had collected at one point and caused the obstruction in the main.

Tests carried out on the main following the re-connection of the gas supply showed an improvement in transmission efficiency to 82%-85%. This figure could have been further improved. However, the main was due for early renewal and it was decided not to proceed further.

The deposit was greenish-grey, light, and had the following composition:—

Free sulphur ..	39.6%
Ferric ferrocyanide	37.0%
Ammonium chloride	0.5%
Organic matter	22.9%
	100.0%

Spennymoor Main

Attention was next directed to the main supplying the Spennymoor works. This main was 4,200 yds. in length and it was found that with an initial pressure of 15 lb. per sq. in. a flow rate of 42,000 cu.ft. per hour was obtained. The efficiency of transmission factor was found to be 62%. The need for improving this figure was as pressing as had been the case at Bishop Auckland, particularly since the main was not scheduled for renewal, nor was an alternative supply of gas available for the Spennymoor works.

The main was sub-divided and each section tested separately. The results of this were most disappointing, since it was found that excess pressure losses were not limited to one short stretch of pipe. It was apparent that to effect any marked improvement it would be necessary to clean-out a considerable length of main. It was decided to remove a 70-yard section of pipe for examination to determine the nature of the deposit. It was found that the pipe was almost half full of a soft deposit. Cleaning was carried out as follows:

(i) The main was opened out at two places some 40-60 yds. apart and a pipe cut and removed at each place.

(ii) Rods were pushed through the main, and a winch cable was attached to the end of the rods, which were then withdrawn.

(iii) A steel tubular scraper was fitted to the end of the winch cable, a trailing cable being fitted to the scraper. These were drawn through the main using the winch, the trailing cable being used to return the winch cable.

(iv) The operation was repeated using a full-sized scraper and finally an over-size rubber disc stopper.

The use of the winch enabled a steady purchase to be applied to the scrapers, and this greatly assisted in avoiding sudden movement of the scrapers which might have caused them to stick. The oversize rubber disc was most effective in removing the bulk of the deposit, and in fact left the pipe practically as clean as the day it was laid.

The men employed on the coke oven main became so practised that it was possible to cut the main, clean out a 50 yd. section, and reconnect the supply within an hour. The only delays which occurred were due to difficulties in pushing the rods through the pipe where this was heavily made-up with deposits. It was eventually found preferable to use lengths of ½-in. steel tubing in place of rods.

The material removed from the main was semi-liquid and was bright yellow initially, but this changed to a dark green within a few seconds of being exposed to the atmosphere. Analysis was made difficult by the fact that, as soon as any attempt was made to dry the deposit, it immediately fired. Its composition was as follows:—

Moisture	35%
Iron oxide	37%
Sulphur	28%
Volatile matter	
Organic matter	
	100%

The total quantity of the deposit removed from the 1,900 yds. of main cleaned in this manner was recorded.

(*Continued on p. 226*)

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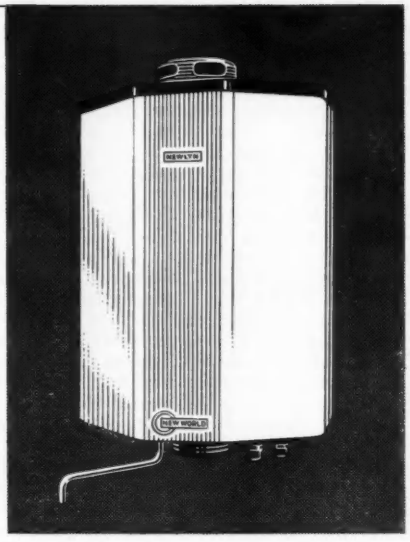

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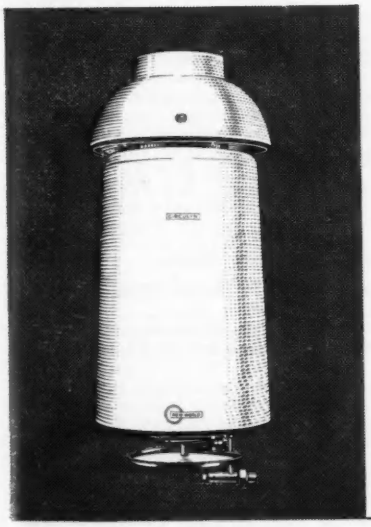

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It represented some 30% of the capacity of the pipe. After concluding this work, it was found that the main was capable of passing 94% of the theoretical quantity of gas. The pressure-drop over those sections of main which had been cleaned agreed almost exactly with the calculated figure.

The labour costs, priced at plain time rates, amounted to 5s. 7d. per yd. of main cleaned. This was less than one-third of the cost of replacing the pipes.

Conclusions

Crude coke oven gas mains should be fitted with test points at regular intervals which should be not greater than 400 yds. Also, pressure tests should be made every four to six months at each point. These should be recorded, together with the gas flow rates. With this information any deterioration in the condition of the main could be readily detected.

More attention should be given to the location and number of syphons fitted on a high pressure main. The installation of large syphons is to be recommended, particularly in the vicinity of the coke ovens.

The effect of high velocity gas flows in preventing water gravitating to syphons is a well-known phenomenon and can lead to peculiar results. For instance, before the stoppage on the Bishop Auckland coke oven main was located, the Darlington unit used to assist by checking the valve on the 12-in. main. The checking-back at Darlington lifted pressures on the Bishop Auckland branch, but on more than one occasion this had the effect of reducing the amount of gas received by Bishop Auckland. Initially, the increased velocity of gas caused water lying in a level section of main to be carried beyond the obstruction into the rising section of main. This additional water surging in the main above the obstruction further increased the resistance to the flow of gas, so that the eventual result was a reduction in the quantity of gas reaching Bishop Auckland.

In ordinary circumstances the effect of water travelling-up rising sections of main can cause trouble and can only be obviated if the number of syphons fitted is generously allowed for, even to the extent of fixing syphons in a rising section of main.

DISCUSSION

Mr. T. R. Wicks (Workington) asked whether the 6-in. branch mains and the 12-in. Darlington mains were coated originally, and whether the 12-in. replacement main for Bishop Auckland was to be coated. How often, he asked, were the syphons along the route of the 6-in. main emptied, and what kind of joints were used when reconnecting the pipes after each cut? Further, was any pressure fluctuation detected before the water, trapped in the Bishop Auckland main, was removed?

Mr. Tait replied that the original mains supplying all three works were coated inside and out. The replacement pipes were to be coated outside only. The syphons were pumped at monthly intervals. When reconnecting the pipes screwed gland collars were used throughout. No pressure fluctuations could be detected when testing the Bishop Auckland main.

Catalytic Effect of Iron Oxide

Mr. B. Richardson (Newcastle) remarked that the author would remember some nine years ago he helped in investigating a stoppage in a coke oven main which supplied a works controlled by the Newcastle and Gateshead Gas Company. The stoppage in that case was naphthalene. Many other deposits which he (the speaker) had investigated had contained a proportion of iron oxide, which, he felt, was the prime factor in initiating stoppages. This iron oxide, formed by corrosion of the pipe metal, could act in two ways. First, it could react with H_2S in the gas to give iron sulphide, which was then oxidised by the oxygen in the gas. This gave iron oxide once more, which continued a process which gradually resulted in an accumulation of sulphur. Moreover, the iron oxide could react catalytically and cause decomposition of the H_2S to give free sulphur and hydrogen. He had also found these stoppages to contain a high proportion of organic matter, which he thought was polymerised gums. In regard to the reduction of the H_2S content of the gas between the coke ovens and the various works, he calculated that some 1,000 lb. of sulphur were being taken from the gas each day.

Mr. Tait said that after-coolers were not fitted to the compressors at the Brancepeth works, with the result that there was a considerable amount of condensation from the gas in the sections of main nearest the coke ovens. In fact, at one point, a special syphon has been fitted with a capacity of 300 gal. The sulphur compounds dissolved in the condensation products accounted for a high proportion of the reduction in sulphur content. As far as the organic matter was concerned, it was felt that the bulk of this was due to the original internal bitumen coating of the pipes.

Mr. Ollerenshaw asked what steps, if any, were being taken to avoid future accumulations of deposits. Was there any indication of wastage of pipe?

Mr. Tait replied that purifiers were in course of construction at Brancepeth works, and it was hoped that purified gas would be available in approximately 12 months. The pipes did not show any deterioration due to internal corrosion.

Mr. Dawson (Carlisle) asked if trouble was experienced due to the sticking of the scraper in the pipe.

Mr. Tait replied that the scraper was carefully designed to avoid, as far as possible, any possibility of its sticking at the pipe joints. On only one occasion did the scraper lodge fast in the pipe.

The Problem of Pipe Corrosion

Mr. F. J. Webster (West Hartlepool) said that he had experienced the same trouble with coke oven supply mains. A soft wet deposit was found in the vicinity of the coke ovens and a hard dry deposit nearer the receiving works. So far as pipe corrosion was concerned, he could confirm that the cast iron mains showed very little deterioration, but a section of steel pipe had to be replaced after five to seven years working. He disagreed with the recommendation regarding the frequency of testing. At West Hartlepool they used recorders for continuous testing and carried out a series of spot tests each month.

Mr. Tait said that a number of recorders were fitted at vital points along the route of the main, and the charts were changed daily. So far as spot tests were concerned, he felt that, if tests were carried out more frequently than was essential, the results were not given the attention they deserved. Spot tests at as large a number of points as possible, two to three times each year, should suffice.

Mr. P. N. Lee (Middlesbrough) explained that he had experienced no trouble with the main supplying the Middlesbrough works. The gas leaving the coke ovens contained no naphthalene or ammonia, nor did the pressure ever exceed 3 lb. per sq. in. Perhaps one of these factors might influence the formations of deposits in the Brancepeth to Darlington main.

Mr. Tait commented that the Brancepeth coke oven gas was also free from ammonia and naphthalene nor did the deposits contain any traces of these substances. They used pressures of 30 lb. per sq. in. to deliver the gas to the various works; and since H_2S was an unstable gas, decomposition due to this compression was bound to occur to some degree. The length of the main, and the time factor, together with the excessive condensation in the main, might explain why they got deposits, whereas Middlesbrough did not.

Sulphur Removal in Mains

Mr. C. Hindle (Darlington) said that if Mr. Richardson had seen the amount of sulphur found in the 12-in. coke oven main, and in the Darlington 24-in. main, he would appreciate that the figure of 1,000 lb. of sulphur removed from the gas each day was not a high estimate. At Darlington sulphur was deposited at every change of direction of flow of the gas. This appeared to be different to the experience at Spennymoor. The deposits were dry and also liable to spontaneous combustion. He agreed that corrosion of the pipes was slight. At Darlington they had never had to replace a pipe due to corrosion.

Mr. Tait said that the bends in the Spennymoor main were clear of deposits while the long straight stretches of pipe were heavily made up. They attributed this to the fact that when the gas was flowing along a straight stretch of pipe, turbulent flow would be replaced by streamline flow, and this would tend to permit suspended matter to be more easily deposited. This argument did not hold good as far as the Darlington end of the 12-in. main was concerned. The difference might be due to the fact that the gas in the Spennymoor 6-in. main contained a higher proportion of water vapour while that reaching Darlington would be much drier.

TRAINING OF MAIN AND SERVICE LAYERS

FROM A PAPER TO THE YORKSHIRE JUNIOR GAS ASSOCIATION, JANUARY 9, BY

R. H. O'NEILL,

Assoc.M.Inst.Gas E., Distribution Engineer, Huddersfield-Halifax Group, North Eastern Gas Board.

WHEN the North Eastern Gas Board came into being, its area was divided for operational activities into six groups and a gas grid. To each of these a group distribution engineer was appointed. In 1950 a series of regular meetings of these group distribution engineers was started under the chairmanship of the Chief Engineer of the Board. It quickly became evident that one of the most serious problems facing every group was the shortage of competent main-layers and service-layers. The general standard of main-laying and service-laying was not in line with requirements. All groups had a nucleus of good men who had served their various undertakings well, but most of these men were no longer young. And it was apparent that in almost every undertaking, when the retirement of these men fell due, replacements for them would be inadequate in number and quality. The fact was that younger men were not entering the service of the industry as labourers, to train to service-layers and eventually main-layers.

It was necessary to find some means of attracting the right type of man, and then to ensure that he was given the opportunity to improve his status, and at the same time carry out a better job for the Board.

In this part of the country main-laying and service-laying had never been considered a fully skilled job, and no apprenticeship was served by the men who carried out the work. The sequence of promotion was usually—labourer, service-layer and jointer, main-layer and ganger main-layer. The process was usually a slow one, and the eventual product was regarded as 'semi-skilled.' Little or no organised training was given, each man learning in the school of experience, picking up good or bad methods of carrying out his job from the older men with whom he worked. Bad main-laying practices were liable to be inherited by trainee main-layers because of the lack of properly supervised training.

The industry, speaking generally, had for many years encouraged the training and education of the engineer, the gas fitter, the salesman, and others, but had done little to encourage or train the main-layer and service-layer.

It was soon appreciated in the N.E.G.B. that a training scheme for main-layers and service-layers was necessary. Whilst it was easy to agree that such a scheme was desirable, it was not so simple to bring it into effect. Many questions arose, for example:—

Should there be separate courses for main-laying and service-laying, or should they be combined?

Should the classes be held at night or during the day?

Should one or two classes be held each week over a period, or should the course be continuous for a week or more?

How many men should be in each course?

What should be the balance between theory and practice?

How should the timetable be made up?

Should there be any examinations?

Should each group hold its own course, or should men from each group mingle with each other?

Should a full-time instructor be appointed?

What numbers of men would be taking the courses?

How much would it cost?

These were among the queries; but first was the problem of *what* should be taught to the men.

Seventy-eight separate undertakings had been combined to form the Board on vesting day, and main-laying practice was not alike in any two of these districts. A code of practice common throughout the Board's area had to be agreed before instruction could start. No standard comprehensive text-book suitable for main-layers was available. It was considered best to have one course for main-laying and a separate course for service-laying. Main-laying instruction was regarded as being most urgently required.

A sub-committee of two group distribution engineers was asked to investigate and submit a report on the framework of a scheme for a central course in main-laying, designed to standardise and subsequently improve the methods throughout the area of the Board. The report was submitted to the Board and approval in principle was given. The appropriate trades unions were consulted, and their approbation was obtained.

Eventually a code of practice for main-laying was completed and edited. It must be emphasised that it was compiled for the main-layer rather than the distribution engineer, and was intended primarily for the guidance of the instructor. A provisional syllabus was drawn up, based upon this code. District distribution superintendents and supervisors were acquainted with the aims and details of the proposed scheme and were provided with copies of the code. It was decided that the best method of carrying out the training was to have a concentrated practical course lasting two weeks, with a full-time instructor in charge. An instructor was appointed and a timetable was prepared.

Originally, arrangements were made to have one training centre serving each of two adjacent groups, with one course held at each centre every third fortnight. Experience soon showed that this method had several disadvantages, and before long roughly four courses out of every five were held at Leeds, and one course in five was held at Hull. As Leeds was centrally situated for the Leeds, Bradford, Wakefield, and Huddersfield-Halifax groups, together with the grid and the western part of the York-Harrogate Group, travelling difficulties were kept within reasonable bounds. The Hull Group and the eastern part of the York-Harrogate Group were so far distant from Leeds that it was impracticable to send men to the Leeds centre. Therefore a course for men from these districts was held periodically at Hull.

The course occupied 10 days, Monday to Friday inclusive, for two weeks, working from 9 a.m. to 4.30 p.m. with 30 min. for lunch. All men travelled from their homes to the training centre each day and no overnight stays were involved.

It was originally considered that six men only should take each course, and experience has shown this to be the maximum number which can be handled on a course of this nature, because it is definitely practical. No examination of any sort was contemplated. As far as possible, one man from each group attended each course. This meant less tax on the limited man-power resources of the groups, particularly at busy seasons, and the greatest possible mixing of men from different districts, with different backgrounds and experience. Because of the geographical difficulties, this was more difficult when courses were held at Hull.

The training courses for main-layers ran from January, 1951, to July, 1953, and will be resumed later. While this was proceeding, a code of practice for service-laying was prepared on similar lines. The method employed for main-laying instruction had proved so successful that the service-laying course was modelled on it, but the length of the course was one week only. The first course for service-layers began in September, 1953, and courses are proceeding.

Up to now, 191 men have taken the course in main-laying and 79 have taken the course in service-laying. The majority of these were main-layers or service-layers, but a small number of technical assistants and other staff grades have attended. Normally there have been six men in each class and this seems to have been the most satisfactory compromise between the practical and the ideal

number. For various reasons, seven or eight men have occasionally attended the same course. These numbers have proved somewhat unwieldy, and loss of interest on the part of the men has been noticed. One or two classes of four men only have proved very successful.

Exchange of information on conditions in each district is encouraged. Immediately after lecturing on a particular subject, the instructor follows up by demonstrating and letting men carry out the work themselves, usually in pairs. As it is essentially for manual employees, the course is kept as practical as possible. Simple drawings and sketches are used extensively and are most helpful to the trainee.

Arousing Interest and Discussion

The technique frequently employed by the instructor is to raise a debatable point to arouse interest, and allow the lecture to take the form of a discussion of various methods. This is concluded by giving the method approved in the code of practice, and the reasons why any particular method has been adopted. The pipe manufacturers and other specialist firms have been most helpful in providing equipment, drawings, and explanatory literature. The instructor has visited several of these manufacturers' works to ensure that the methods he is teaching are in agreement with the makers' recommendations.

A great deal naturally depends on the tact and skill with which the instructor handles the class, and the results obtained suggest that he has been very successful in the great majority of cases in overcoming any prejudice or obduracy which has been encountered. There always remains the occasional 'hard nut' who refuses to be convinced that ways other than his own can be better; but it is to the credit of the course and the instructor that these are few and far between.

Generally speaking, men from the smaller undertakings, even when they have considerable experience, are not afraid to plead ignorance of a particular technique, while those from the larger districts appear to take it as a slight on their own undertaking if they admit to imperfect knowledge of a subject. It is necessary, therefore, to treat all trainees as being in need of instruction. On the whole the course has been well received by the men, and the recommendations of the code of practice are accepted as being practical.

At the end of each course the instructor presents a written report in general terms to the Group Distribution Engineers' Committee. It is pointed out at the outset of each course that each man is there to see and carry out under classroom conditions the approved way of doing things, but that also his own experience may well be of use in modifying or improving these methods. It was realised from the beginning that the code of practice could not be regarded as final and complete. Several recommendations emanating from discussions during the various courses have subsequently been incorporated in the code.

The Cost of Training

A survey of the costs of the main-laying courses shows that the average expenditure per man is £23 11s. 6d. This figure includes the instructor's salary, men's wages, travelling expenses, and subsistence allowances, cost of the work necessary in preparation for the implementation of the scheme, and other indirect costs. The service-laying course of one week only will obviously cost less per man, but no accurate figures are yet available. Many of the men are now showing a greater interest in their work, and have a better appreciation of the ultimate effect of carrying out a job in a proper manner. They feel that their status has been raised, for they now appreciate that their job is an important one requiring skill and initiative. Greater confidence in their own ability has resulted in fewer stoppages and delays formerly caused through undue reliance on their supervisors' guidance. Men who at one time were apprehensive about tackling a job are now organising their work more efficiently and showing greater initiative.

More concern is being shown for the care and maintenance of tools and equipment. This must lead to a direct saving to the Board by reducing the number of replacements. There is less tendency to improvise, with the result that a higher standard of work is produced. Safety precautions have been more strictly observed by the men who have taken the course, and in turn they have set a better example in this respect to others who have followed their lead.

Although it is difficult to find actual proof, it is highly probable that the £23 11s. 6d. spent on each man's tuition has already been saved by economies on the job resulting from the saving of time of the main-layer and his gang. Bearing in mind the present high cost of materials and reinstatement it is not difficult to imagine that a single job can show a saving of £23 when carried out more efficiently. And it is encouraging to note that several main-layers are now taking evening classes in gas fitting at technical colleges, in order to improve their general knowledge of district work and consumer service, as well as their own technique.

SCOTTISH EASTERN JUNIORS AT DUNDEE

A MEETING of the Scottish Junior Gas Association (Eastern District) took place at Dundee on January 9. It was a short (?) paper meeting, the following subjects being dealt with: 'Impressions of a Mechanical Producer,' by Mr. J. C. MacDonald, of Perth; 'New Plant at Dunfermline,' by Mr. A. M. Thompson, of Dunfermline; and 'The Effluent Problem in Scotland,' by Mr. D. C. Elgin, Scottish Gas Board.

In the course of his paper, Mr. Elgin said:—

In Scotland we carbonise coals in the lowest ranks. The proportion in the range 'not so good' to 'hopeless' has been increasing annually, and it is estimated that, of our total purchases of about 2.42 mill. tons per annum, 0.89 mill. tons are in rank 700, 0.73 mill. tons in rank 800, and 0.21 mill. tons in rank 900, a large proportion from each being carbonised in continuous vertical retorts. We are, in fact, and particularly in the east, in the unenviable position of being able to claim a unique experience in handling these 'impossible' subjects. The following factors affect liquor quality and, incidentally, quantity:—

(a) The absence of caking properties modifies the distribution of heat penetration into the charge.

(b) Coke is relatively reactive to steaming, and decomposition to blue water gas is rapid and highly efficient.

(c) The continuous vertical retorts are operated to give a gas of lower average calorific value than generally produced from, say, Yorkshire coals. While the Scottish Gas Board's average calorific value is about 435 B.Th.U. per cu.ft. this is mainly due to the 450 B.Th.U. per cu.ft. at Edinburgh and Glasgow, the average for the large number of smaller undertakings with continuous vertical retorts being about 425 B.Th.U.

(d) Most Scottish gas-making coals have a relatively low sulphur content, usually well below 1%. This is reflected in the H_2S content of the crude coal gas, which is seldom above 450 grains per 100 cu.ft.

(e) The nitrogen content of our coals is also relatively low, again usually below 1%.

A large number of full liquor analyses would have to be made to establish the effect of these factors throughout Scotland. A tentative study has suggested that, even with the volume produced kept at a minimum, as it should be, our liquors, whether crude or stripped, whether from normal horizontal or normal continuous vertical practice, are less harmful, both from the point of view of toxicity and in their capacity for oxygen, than the generally accepted averages.

Sulphides, which can lead to a toxic atmosphere in sewer manholes, are in many cases present in our crude liquors in concentrations below 0.15 grammes per 100 c.c. (horizontal retorts or 0.1 grammes per 100 c.c. continuous vertical retorts) and thiocyanates which can thoroughly upset sewage purification plants are also in relatively small amounts—usually below 0.12 grammes per 100 c.c. Even more important, the overall oxygen-absorption figure (excluding sulphide) for crude liquor from our horizontal

retorts is normally less than 650 parts per 100,000 and from continuous vertical retorts less than 1,100 parts per 100,000. In neither case does the ratio of higher tar acids to monohydric phenols exceed accepted average proportions.

Local authorities at places in Scotland where the gas-works are being built as production centres for a few communities should be able without difficulty to accept volumes considerably in excess of the percentages normally quoted

Improving the Crude Liquor

We could simplify matters by more careful attention to the production of crude liquor—*e.g.*:—

(i) the volume of effluent per ton of coal should be kept at a minimum. Excessive dilution of the inlet crude liquor reduces plant capacity and raises the operating costs.

(ii) Separation of tar and liquor should take place as soon as possible and they should be stored separately. This is particularly important where there is a strong objection to the higher tar acids content.

(iii) The practice of admitting air for revivification on the inlet side of the exhausters should be discontinued. Air drawn in at retort mouthpieces through inattention can also adversely affect the quality of a liquor by oxidising higher tar acids during initial cooling and condensation, perhaps heightening the colour of the final product.

(iv) The ammonia passing to the inlet purifiers should be kept at an absolute minimum and if possible dispensed with entirely, and this will be aggravated by allowing too much free ammonia to pass forward forming soluble thiocyanates, sulphates, and thiosulphates, always at the expense of the recoverable sulphur. After sundry uncomfortable and apparently inconsistent experiences of the influence of ammonia on dry box purification I had come to wonder vaguely who had first stipulated that 4 grains of ammonia per 100 cu.ft. of gas should be allowed to pass to the purifiers. Richardson answered this in an enlightening little article in the 'GAS JOURNAL' (May 24, 1950, p. 513) 'it is not known'! Wedgwood, in a letter to the 'GAS JOURNAL,' of June 28, 1950, p. 940, arising from his diverting and constructive paper 'Operation Effluent' suggested that it might have been someone who could not get his washers to work properly! In any case, due to its probable high toxicity, purifier liquor should never be disposed of separately to a sewer, but mixed with the main volume of effluent.

Minimum attention prior to disposal to sewers should—

(a) ensure freedom from tar film and globules;
(b) ensure freedom from suspended solids;
(c) keep temperature below 110°F.;
(e) regulate the flow as required by sewage or other authorities.

The use of crude liquor as a direct fertiliser provides a means whereby even the smallest works can find an outlet for the product which conserves the nitrogen fixed in the carbonisation process. The Board is collaborating with the Edinburgh and South-East Scotland College of Agriculture in trials to determine the effect of liquors produced under various conditions on pasture land and arable crops. The results of the first set of tests in the spring of 1953 were encouraging and have led to plans for more extensive trials this year.

PROGRESS IN THE OLDHAM-ROCHDALE GROUP

FROM A PRESIDENTIAL ADDRESS TO THE MANCHESTER DISTRICT JUNIOR ASSOCIATION OF GAS ENGINEERS, BY

J. OATES,

B.Sc., A.M.Inst.F. Oldham-Rochdale Group, North Western Gas Board.

THE OLDHAM-ROCHDALE GROUP of the North Western Gas Board comprises the industrial towns of Oldham, Rochdale, Middleton, Heywood, and Littleborough, together with the many small outlying townships. Yet when Murdoch first succeeded in manufacturing coal gas for the purpose of lighting his house, this area presented a very rural aspect with wooded hills, rivers, and meandering streams. Oldham, the largest town in the Group (present population 120,000), had only some 10,000 inhabitants, and Rochdale less than half that number, Middleton had just become by Letters Patent a market town with the additional importance of an annual fair.

It is recorded that in the Rochdale area alone there are now no fewer than 124 out of a total of 166 occupational groups throughout the country. This is surprising when we consider that over 40% of the working population there are engaged in textiles.

The outbreak of war in 1939 was a turning-point in the use of gas in industry. The immediate call for weapons of war and the colossal impetus for heat-treatment processes caused an unparalleled demand for gas. The ensuing years offered little respite; the industrial gas load in the Oldham area rose from 850,000 therms in the year ended March, 1939, to 2,890,000 therms in 1944, equivalent to an increase of 240%. Mass-production called for uniformity of the product, precision temperature control by automatic gas-fired equipment had solved the problem, and the consistency of the supply and quality of the gas had won the day.

The end of hostilities, however, saw the start of the great 'switch-off.' In a very short time many large gas consuming plants had closed down, their great task honourably completed. Inevitably the industrial gas load began to diminish. Prior to 1945, the only undertaking within this Group to offer any reasonable service to industrial consumers was Rochdale, where such services had been a function of the distribution section since 1935, with gratifying results to the management.

In 1945, the Oldham undertaking began to take steps to ensure that a major portion of the industrial load might be retained, and I was allowed to assist in the formation of an industrial and commercial sales and service department which was to offer all technical services to such consumers. Within two years the rapid decline in industrial load had been arrested. Subsequent increases were achieved by multiplicity of installations rather than by successful conversion of a few large industrial consumers or further influx of any appreciable gas-consuming industry into the area.

Installations have included the space heating of works and offices; hot water and canteen facilities; core, mould, and ladle drying, and multifarious other drying operations; non-ferrous metal melting; annealing, normalising, hardening, tempering, and vitreous enamelling furnaces; oxy-coal gas cutting and welding; solution tank heating; steam raising, etc. Large increases in output have also been effected by increasing use of gas in the manufacture of food products—bread and confectionery, biscuits and potato crisps, etc.

While great changes have been seen in the influx of various industries, the commercial class of consumer has changed little over the years, except in numbers. Although Rochdale is the birthplace of the co-operative movement, the small 'family' trader is in preponderance in

the area. Increases in commercial load have been effected mainly by the increasing popularity in the use of gas for bakers' ovens, fish-frying ranges, and central heating. In the Oldham undertaking the total consumption from these sources rose from 41,470 therms during the March quarter, 1944, to 290,657 during the March quarter, 1952, representing an increase in the percentage of the total commercial load from 16.15% to 51.15%.

Gas is also used extensively in the kitchens of hotels, restaurants and cafes: for space heating other than by central heating boilers; for steam raising for clothes presses, for coffee roasting. cooked meats. toffee boiling. tailors' irons, etc. Increasing demand has also been for the provision of hot water facilities, including supplies to electrically-operated washing machines in launderettes. It is also used to warm the water at a local public baths, and for the three crematoria in the area.

The Domestic Load

The following details of load within the Group are available for the year ended March 31, 1953:—

Actual Sales as Metered:

		Therms	% of Total
Domestic:	Ordinary	3,183,099	15.4
	Prepayment	7,973,134	38.6
	Total	11,156,233	54.0
Industrial		5,475,772	26.5
Commercial		3,063,944	14.8
Public administration—Total		396,526	1.9
Public lighting		569,437	2.8
		20,661,912	100.0

The domestic load has been largely influenced by the industrial expansion. An expanding, thriving industry reflects greatly the purchasing power of our consumers. Industrial recession in the cotton industry in the 1930's drove thousands from the district and a decline in domestic consumption resulted. We are still dependent on the cotton industry, as the slump in the spring of 1952 confirmed, but not so greatly as in the past.

The average consumption per domestic consumer within the Group is 100 therms per annum. Although this is below the average for the North Western area, many factors adversely affect any great potential increases:—

(1) The high proportion of cottage property in the locality.
(2) Decline in the lighting load.
(3) Increased canteen facilities in factories and workshops.
(4) Increased use of ready-cooked foods.
(5) Greater efficiency of appliances.
(6) Reduced purchasing power due to reduction in overtime working and less part-time employment of women.
(7) Hire purchase restrictions and the incidence of purchase tax.

The Future

Specialisation will necessarily continue within the gas industry; yet we are all inter-dependent. Ultimate success will be a measure of our united endeavour. We are entering an era of increasing competition from other fuels—fuel oil and electricity in particular. My colleagues in the industrial gas field will support me when I tell you that we are also meeting increasing 'technical opposition,' for our competitors are extending technical services to industry.

The Ridley Committee Report, which claimed that the only large-scale advisory service to industrialists was provided by the Ministry of Fuel and Power, was challenged by the gas industry. It is now being refuted by the other fuel industries. Never before, I suggest, has there been such a need for qualified and experienced industrial engineers with intimate knowledge of local industry and the ability to safeguard zealously those loads we have fought for and secured in the past, to expand those loads, and to obtain new ones in the future. The work in increasing the efficiency of gas production and distribution will doubtless result in a cheaper therm, yet this will be of little avail if we allow any inefficiency in utilisation of gas. Let me illustrate this by two examples of local industrial service:—

(1) I had occasion to visit a factory using gas for space heating, where increasing price of gas was causing some anxiety, and where other fuels were being considered. After only 10 minutes inspection of the appliances used, it was suggested to the consumer that it would be possible to reduce the consumption of gas by at least 20% if they would allow us to service and readjust the equipment. This was equivalent to offering a substantial reduction in the price per therm, and our suggestion was readily agreed to. When carried out, our claims were confirmed, and the consumer is still using gas.

(2) Another consumer was spending £200 per week with our competitors. The system used had obviously a very low overall efficiency, and we were confident that we could substantially reduce the fuel cost by gas-fired equipment. The consumer needed no further encouragement and joined wholeheartedly in our research, even to the extent of flying thousands of miles inspecting various plants on the Continent. I am indeed 'cutting a long story short' when I say that a gas-fired plant was installed and the fuel cost fell to £30 per week.

The fact remains that throughout the country there are industrial areas where there are no local technical industrial services, or where existing facilities are inadequate. Steps should be taken, without delay, to remedy this failing. The right men must be attracted to the industrial gas sections of our industry, for it is to industrial and commercial consumers that, I suggest, we must look in the near future if we are in any measure to increase our output.

INSTRUMENT EXPOSITION

THE first International Instrument Exposition, sponsored by the Instrument Society of America, has received contracts from 287 exhibitors for 573 exhibit booths at the Philadelphia Convention Hall for September 15-21. The show increased its exhibit area from 10,000 sq. ft. in 1946 to 35,000 sq. ft. in 1953, and the exhibit area so far sold for the 1954 show totals 57,000 sq. ft. With only a few booths still available, the management has found it necessary to contract for additional space which will boost the display area another 25%.

The attendance in 1953 was slightly over 11,000. More than 25,000 visitors from all parts of the country and many foreign countries are expected to attend the international show. Over 70 technical sessions have been arranged by the Instrument Society of America, sponsor of the congress and exposition, and by a dozen co-operating Societies. Further information may be obtained from the Managing Director, First International Instrument Congress and Exposition, 845, Ridge Avenue, Pittsburgh 12, Pennsylvania, U.S.A.

CATALYTIC CRACKING

RESULTS of a pilot plant investigation of the catalytic cracking of hydrocarbons of low molecular weight, in the presence of steam and air, as a method of producing equivalents of various types of utility gases, manufactured and natural, are presented in Research Bulletin No. 6 of the Institute of Technology, Chicago. Hydrocarbons gasified in this study included natural gas, refinery oil gas, propane, butane, gasoline, kerosine, crude naphtha, and light gas oil. It is shown that cracking them to produce a low heating value 'carrier' gas, and subsequent enrichment of this carrier gas with natural gas or propane, is a means of providing base load substitutes or peak load supplements for utility systems distributing carburetted water gas, coke oven-carburetted water gas mixtures, natural gas, or manufactured gas-natural gas mixtures. The work was conducted by the Institute, under the sponsorship of the American Gas Association, with the co-operation and assistance of the Philadelphia Electric Company at the latter's Chester, Pa., station.

THE TECHNICAL RESOURCES of International Combustion, Ltd., and Carl Still, the European designers of coke-oven plant, have been combined in a new organisation, International-Carl Still, with offices at 19, Woburn Place, London, W.C.1.

IMPERIAL CHEMICAL INDUSTRIES, LTD., is among a number of undertakings to be approached by the Scarborough Corporation, which is endeavouring to establish new industries at Eastfield, Scarborough.

TOWN GAS PRODUCTION

PAPER TO THE YORKSHIRE JUNIOR GAS ASSOCIATION ON JANUARY 20, 1954, BY

A. F. COTTRELL,
M.Inst.Gas E., Deputy Chief Operating Engineer, and
T. W. AUSTEN,
M.Inst.Gas E., Design Department, Woodall-Duckham Construction Co. Ltd.

SINCE THE first days of gas there have been constant endeavours to improve methods of manufacture and to obtain greater efficiency from every item of plant on the works. Considerable success has been achieved in this respect, with the result that carbonisation is far and away the most efficient method of processing coal. A thermal efficiency of 80% to 85% is readily obtainable from a modern carbonising plant, and, in fact, from a study of the Ministry of Fuel and Power Statistical Digest, 1951 (Table 109) it can be calculated that the gas industry, as a whole, had a thermal efficiency in excess of 75%, against 20% to 25% for all other coal users.

Table 1 shows that there has been an increase in the make of gas per ton of coal from 15,800 cu.ft. in 1921 to 18,300 cu.ft. in 1952, while the coke yield has increased from 13.06 cwt. per ton to 13.48 cwt. This, of course, is not wholly a measure of increased carbonising efficiency as water gas and changes in calorific value have both played their part. Nevertheless, it shows very clearly that the gas industry has made big strides in using coal to the best advantage.

TABLE 1
(*Gas Council Report* 1952-53 *Appendix* III—*Section* A)

		1921	1930	1940	1952-3
Coal carbonised ..	mill. tons	15.776	17.669	17.356	27.476
Total coke made ..	,, ,,	10.405	11.913	11.704	18.6 app.
Total gas made ..	mill. cu. ft.	249,018	299,843	297,691	501,265
Total gas bought ..	,, ,,	1,325	13,201	36,883	68,073
Total gas available for sale	,, ,,	250,343	313,044	334,574	569,338
Coke used for water gas	mill. tons	1,254	0.790	0.552	1.369
Oil used for water gas ..	thou. tons	195.9	185.8	152.2	436.0

From this it will be observed that comparing 1921 with 1952-53:—

Whereas coal consumption is up by ..	74%
Gas available is up by as much as ..	128%
Coke used for water gas manufacture is up by	10%
Oil usage is up by	123%

Coke oven gas has increased from 0.5% to 12.4% of total gas available for sale.

As regards gas-making methods, Table 2 indicates the percentage thermal amounts of gasworks plant and shows very clearly how carbonising methods have changed. When your Association was founded there were no vertical retorts and chambers. Today such plants are responsible for as much gas as all other types put together.

TABLE 2

	1950-5
Continuous vertical retorts	44
Intermittent vertical chambers	6
Horizontal retorts	30
Coke ovens on gasworks	3
Water gas and other coke-using plant and complete gasification	17

The foregoing Tables prove that the gas industry has played and is playing its part in the matter of coal conservation by modernising its plants and adopting the latest developments. If improvements of this kind were achieved by only a fraction of other users, there would very soon be an end to any fuel shortage.

Consequently it would appear to be reasonable to encourage the gas industry to carbonise more and more coal, and, if necessary, restrict supplies to the less efficient users.

When considering how gas-making plant has been developed it is as well to remember what Burns and Weston said in their paper 'Some Phases in the Development of the Rectangular Vertical Retort' to the I.G.E. in 1949 (Comm. No. 339)—*viz.*, 'Production plants and methods of manufacture in the gas industry, as in other heavy engineering industries, can undergo only relatively slow development, for the nature of the carbonisation process demands plants of robust and heavy construction, with a long life to compensate for the high capital cost; and a plant once installed must continue with the same design for many years. Further, it is not easy to reproduce, comparatively, full-scale operating conditions on a small scale, and, generally speaking, the reasons for promoting any change in design must be founded on research on full-scale operation.'

In view of these remarks, it can truly be said that the gas industry has not been backward in development. Each type of traditional plant is a very much more efficient unit now than it used to be, as is shown by the following notes:—

Continuous Vertical Retorts

This type of retort was introduced about 50 years ago and today two systems share about 95% of the market. The early vertical retorts were built in fireclay, but a silica belt was introduced in 1918 or thereabouts to enable greater throughputs to be achieved. Units are now available to deal with anything from 3 to 12 tons per day. The direction of heating has changed with the times and today upward heating in horizontal flues is usual. Having the hottest zone near the bottom facilitates the production of water gas by steaming and also assists in handling the more highly swelling coals.

Modern continuous vertical retorts are capable of dealing satisfactorily with practically any type of coal, although best outputs are obtained from medium swelling Yorkshire and Midland nuts. Nevertheless, Durham run-of-mine coals can be, and are being, used quite successfully at somewhat lower throughputs and gas outputs. Scottish coals, which have the opposite properties as regards swelling to those from Durham, have been used with great success ever since vertical retorts were introduced, and can be worked at higher throughputs than others. There is a wide choice of calorific values as practically all coals can be steamed to some extent.

Recuperators, which were considered necessary a few years ago, have been eliminated so that the space formerly occupied by them is now available for gas-making, with a resulting higher output per unit of ground area. As shown in Table 4, present-day non-recuperative installations have a very low fuel consumption due to a compact design and preheating of secondary air by heat from the bottom castings and the descending coke charge.

Waste heat boilers are almost invariably included with modern plants and raise approximately 9,000 lb. of steam per ton of fuel used in the producers.

There is a minimum of arduous work for the operatives and modern methods of dust prevention make the plant extremely clean, both inside and outside the retort house.

Intermittent Vertical Chambers

The first of the modern intermittent vertical chamber installations was built at Ramsgate in 1926, although intermittent vertical retorts were built much earlier. Units are available to hold from 1 ton to 4 tons per charge.

The fuel consumption is adversely affected by the fact that red-hot coke is discharged and its sensible heat thereby lost to the system. Consequently recuperators are provided to preheat the secondary air, which means a reduction of steam output per ton of fuel to about 5,000 lb.

It is desirable to select coals having a swelling number of at least 3 so that a coherent coke can be produced, and to discard any which are capable of setting up unduly high pressures which might damage the chamber walls.

Apart from these limitations, intermittent vertical chambers will handle any coal to give high therms per ton of straight gas which can be steamed to almost any calorific value. It is a fact, however, that prolonged steaming adversely affects the life of the chambers, as ash liberated during the steaming period causes erosion of the bottom silica. Therefore, most chamber plants are worked at high calorific values with dilution from external sources to obtain the declared calorific value.

Horizontal Retorts

Horizontal retorts have been in use since the earliest days of gas-making, though modern plants are very different to the originals. As they can be built in small units and are simple to operate they are very suitable for small works. The early settings were direct fired, with perhaps five stop-ended fireclay retorts, carbonising about 10 cwt. per day each. Today, we have 'through' silica or siliceous retorts or ovens in recuperative settings of tens or so, each capable of carbonising 40 cwt. or more per day.

Mechanical charging has been adopted in place of hand or scoop charging and dry ascension pipes have given way to scrubber standpines, so that there is virtually no 'pipe jumping.' The production of naphthalene has been reduced by the use of heavier coal charges, by paying more attention to hydraulic mains, and by the adoption of retort house governors.

Horizontal retorts will deal with any kind of coal, although a swelling number of 3 or more is desirable to obtain a coke of sufficient strength to withstand pushing. Straight gas of a high calorific value is made because efficient steaming is not possible and the high calorific value must be adjusted by the use of some external diluent.

Coke Ovens

Considerable developments have been made in coke oven design and construction in the past 25 years and new batteries have been or are being erected in many parts of the country to replace or supplement the older, less efficient types. As these are mostly 'combination ovens' they can be fired by coke oven gas, blast furnace gas, or producer gas, and are therefore potential producers of town gas as well as additional coke.

Present-day ovens are of silica construction and fully regenerative. They do not produce waste heat steam. As a rule they are about 40 ft. long and vary in width from about 15 in. to 18 in. and are each capable of carbonising something like 20 tons of coal per day. Coke oven plants can only be economical if adopted on a large scale, although, on capital cost alone, a plant of about 600 tons per day capacity compares favourably with other types.

It is generally agreed that one set of machines is capable of pushing approximately 100 charges a day, which means that the most economical battery size as regards labour is around about 60 to 70 ovens. This, of course, is too large for the average gasworks and could only be used in exceptional cases, particularly as the daily gas output per unit area is on the low side, being rather under 1½ therms per sq. ft. (see Table 5).

Coke ovens are somewhat selective as regards coal and they must at least carbonise varieties which produce coke sufficiently strong to withstand the pushing operations. Furthermore, the coals used must not set up unduly high pressures.

Double collecting mains and charging 'on the main' are methods of reducing atmospheric pollution during the charging of coal to the ovens.

Water Gas

Carburetted and blue water gas provided 12.5% of our gas sales in 1952-53. The process is a well-established method of production. When it was introduced into this country in 1890 it was used to enrich coal gas to the then prevailing high standard of illuminating power. It is now extensively used by most medium and large undertakings to dilute coal gas, to meet peak loads, and to assist in controlling the coke market. The ease with which the quantity of oil, and hence the calorific value can be varied makes it an exceedingly flexible unit.

Modern plants are mechanically charged and clinkered and all operations are carried out automatically. Waste heat boilers are usually provided together with water-jacketed generators, while the back-run process of operation is well established.

Heating Carbonising Plants

Until recently gasworks carbonising plants were heated by hot gas made in step-grates or similar hand-fired producers. In horizontal plants such producers have generally been fed with hot run-of-retort coke direct from the retorts, whereas vertical retorts and chambers have used cold coke—either graded, run-of-retort, or a mixture (sometimes with added breeze).

The practical heating of retort settings by hand-fired producers of correct design has always been satisfactory and operating and maintenance costs have always been low. But where coke with much ash having a low fusing temperature is used, fire-cleaning is an arduous job, and consequently some recently built plants have been equipped with mechanical producers.

Such mechanical producers certainly improve working conditions, as they discharge the ashes automatically and can also be charged automatically. In addition they eliminate fluctuations in calorific value and temperature of the producer gas, reduce the carbon content of the ashes and the quantity of dust carried forward into the settings, and are also capable of dealing with high ash fuels without extra labour.

As regards the class of fuel gasified, there appears to be no easily available cheap substitute for coke, which remains the basic fuel, either run-of-retort or sized. Breeze is still not generally acceptable because it can only be gasified at a low rate and therefore calls for additional producer grate area, requires more steam and, in the case of step-grates, more labour, and it gives a higher carbon loss in the pan ash.

The need to secure the greatest possible revenue from coke sales has focused much attention on fuel consumption. As a result the quantity of fuel used on modern plants is much lower today than ever before and the following changes are put forward to account for the improvement:—

Improved regenerator fillings in coke oven plants.

Improved wall insulation in all types of plant.

Use of annular boilers on mechanical producers.

Increased area and rearrangement of air/waste gas flues in recuperators.

More compact design of gasworks settings.

Preheating of secondary air in continuous vertical retorts by use of ducts round bottom castings.

Housing of Plants

Radical changes have been made in this feature with the object of improving the amenities by providing more space, more light, better ventilation and mess-room and washing facilities internally, and a better general appearance externally.

Some intermittent vertical chamber plants (in the south at any rate) have been built without houses and at least one installation of continuous verticals is now being built in the London area in this way—merely with an umbrella roof. This, of course, represents an appreciable saving in cost but may not be suitable for the somewhat colder conditions in the north.

Apart from the added spaciousness of modern retort houses, which in itself is a highly desirable feature, it is usual on continuous vertical retort plants to provide dust extraction equipment to carry the dust away from the coke dischargers to a point outside the building, either to atmosphere or into collectors or washers. On intermittent vertical chamber plants the suppression of dust at discharging points is more difficult to achieve, but it has been done successfully at the chamber tops by the use of a special attachment to the charging car.

(To be continued)

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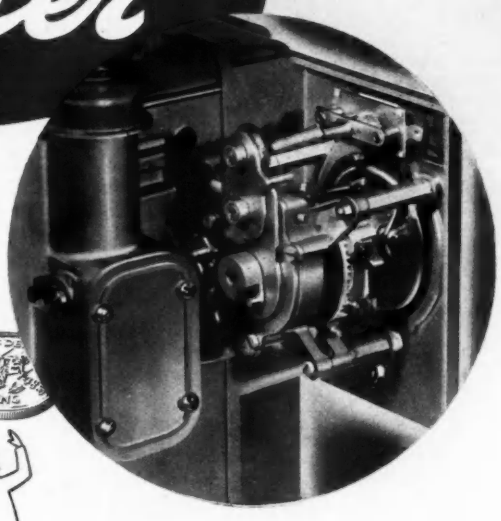

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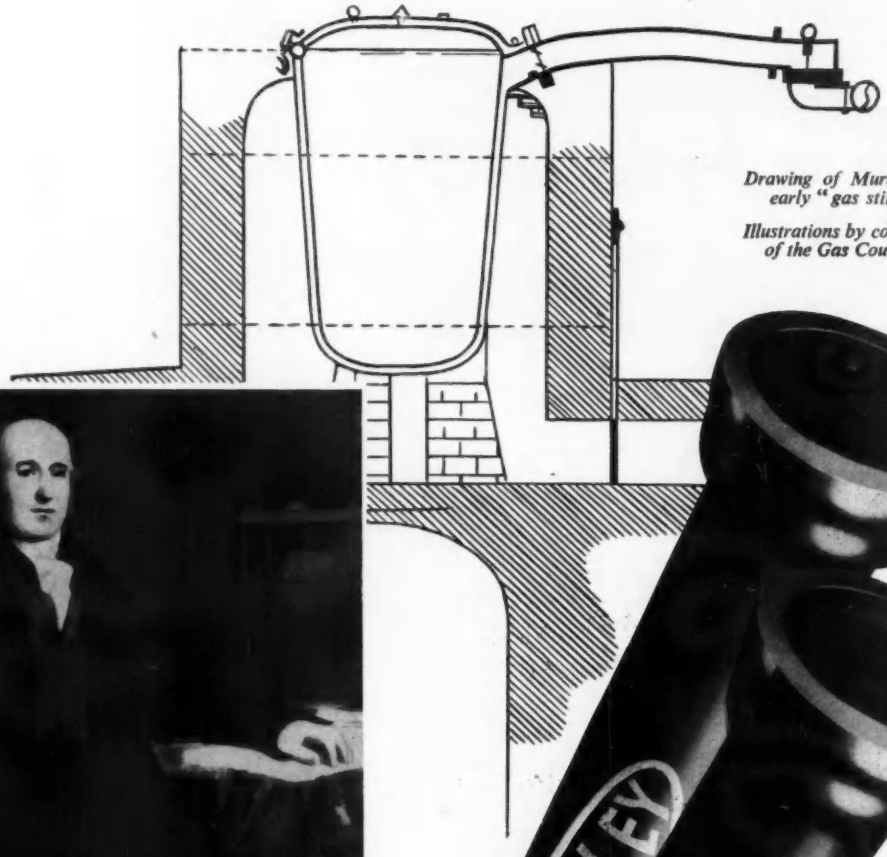
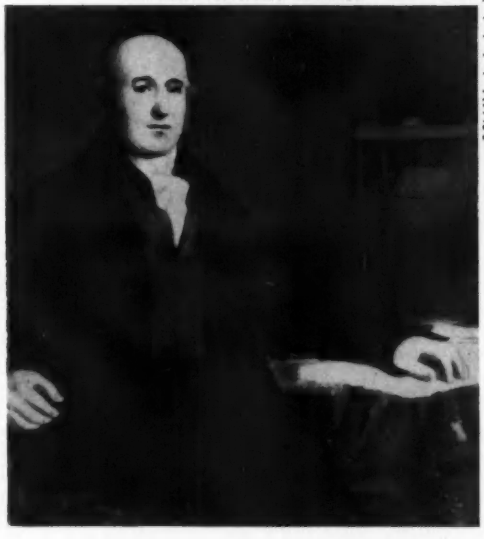


Drawing of Murdock's early "gas still"

Illustrations by courtesy of the Gas Council



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STEAM AND POWER AT BOW COMMON

THE London and Southern Section of the Institution of Gas Engineers at a meeting in London on January 19, under the chairmanship of Dr. J. Burns, heard its Secretary, Mr. A. F. Grant, Station Engineer at the Bow Common Works of the North Thames Gas Board, present his paper on 'Steam and Power at Bow Comon.' The paper was published in the 'JOURNAL' of January 20, pp. 157-165. Before calling on Mr. Grant to present the paper, Dr. Burns referred with sorrow to the death since the last meeting of two members—Mr. Walter A. Barnett, a member since 1924, and Mr. J. S. Thorman, a member since 1916. Congratulations were sent to Mr. W. K. Hutchison, Junior Vice-President of the Institution and Chairman of the South Eastern Gas Board, on the honour of C.B.E. conferred on him in the New Year Honours.

The Chairman said Mr. Grant's paper was really another in a series started some three or four years ago by Mr. H. W. Moys on the day-to-day operation of a routine job on the works. At Bow Common Mr. Grant had some very interesting problems to deal with, and those who had had an opportunity of reading advance copies of the paper would agree that he had made a grand job of preparing it. It was an example of the happy result of the application of a critical and analytical mind to the solution of a problem, or a series of problems.

A Thomas Hardie Achievement

Mr. F. M. Birks (Deputy Chairman, North Thames Gas Board) said he had known Mr. Grant from the day he entered the industry and he had the highest opinion of his capacity and care and hard work. Going back to early history he believed the plant now in operation comprised one of the major reconstructions carried out during the period when the late Mr. Thomas Hardie was Chief Engineer. In those days it was probably the most efficient gas making plant in the whole country; certainly it was the most efficient in the area of the then Gas Light and Coke Company. It was the first of the vertical installations put in on the east side of London, and because of the demand for coke, particularly for household purposes, it was not expected that large quantities of coke would be available for water gas manufacture, and so the old plant was left there. In the course of time that policy had proved to be the right one. They had never made peak load water gas at Bow Common.

The overall efficiency of power and steam supply there was very high indeed when the reconstruction was carried out away back in 1926. As they had always expected the life of a retort house and ancillary plant to be of the order of 40 years, that plant now had only about 13 years to run. It was important that in considering economics they should regard the matter from the country's point of view. He had the greatest doubt about any cost figures that were got out by anybody except himself, and when he got out costs himself his conscience was in equal doubt about them. It might be assumed that the works had about 13 years to run before the Chief Engineer would have the great pleasure of pulling it down and building a new one, because the financial set-up of the industry was such that they would have written off all their works in a given period and would then be able to build new ones.

Waste Heat Turbines

In the light of their present knowledge he thought they would decide to use waste heat turbines in conjunction with waste heat steam, though they had not tested it out yet. There were one or two installations going into operation at works outside the North Thames area, and the North Thames Board itself had schemes for utilising waste heat along those lines. It was desirable to absorb the whole of the steam during the 24 hours by back pressure turbines; no other scheme was so efficient.

It was clear that the North Thames Gas Board's agreement with the British Electricity Authority needed some modification, for it was highly desirable that the Board should be able to export any surplus electricity back to the grid. At the same time the current sold to the B.E.A. must be cheap; it could not expect to get more than what it was worth to them. When the Board exported its surplus electricity the whole situation would change and the other details would just drop into their place. Load factor would just become the load factor of the human being—based on the amount of power required by the human being.

Mr. S. C. Herbert (South Eastern), who expressed regrets for absence on behalf of Mr. C. Stott (Deputy Chief Engineer), questioned whether it was always necessary, when seeking to dispose of surplus heat, to export it only in the form of electricity. A laundry or an engineering works next door might be glad to take it in the form of heat for hot water or other purposes. He noticed that low pressure steam was used for some processes on the works, but not by any means for all. He took it that on the water gas plant the blowers were electrically driven; there was no mention of low pressure steam for that purpose. A useful balancing load might have been feed water heating for the works in general. Power from outside was expensive, and he would have expected to learn that Mr. Grant employed local diesel units for generating peak load power. Outside power was supplied at an efficiency of 22%, whereas diesel generation gave an efficiency of 30%.

Cost of Steam

Mr. F. Dawson (Lea Bridge) said that at Lea Bridge recently they found it necessary to make a steam survey, and it was particularly interesting to see how closely their results could be related to those at Bow Common, obviously because their plant was similar in nature. He was concerned about the costing of the waste heat steam. Mr. Grant had credited it at 8.2s. per unit—that being presumably only the cost of the water and attendance on the boiler. It seemed to him that they should get down to the question of costing the steam, and he had two suggestions to make. It was not very difficult to assess the value of the heat at the inlet of the boiler, assuming it to be a proportion of the coke into the producers. Taking Dr. S. Pexton's 1942 figures he thought he was right in saying that it depended on the amount of excess air in the waste gases, but the proportion of heat fed into the producers was something like 60% from the carbonising process and 40% from the boiler. Assuming coke at, say, 80s. per ton, it seemed they could price the heat of the waste heat boiler at something like 39s. a unit, which, together with the 8.2s. which he assumed covered attendance, made a total of 47s. per unit for steam generation. (A North Thames Gas Board steam unit equals 10,000 lb. steam.)

If it was accepted that costing was right, then it would be agreed that it was wrong to take waste heat steam for power generation because it was luxury, expensive steam. If they priced it correctly, as Dr. Pexton had suggested, they would reduce the heat requirements for the carbonisation process until in fact they had no waste heat steam at all. It was possible to generate on chain grate stokers steam at less than 47s. per unit. Another way of getting the price was to take what L. J. Clark had suggested was the market price for the steam—the price one could get if one was going to sell it. Mr. Herbert had suggested alternative ways of selling it, but generally this high pressure steam was used for generating power, and one must therefore consider the price for buying power outside. Assuming it was from 1d. to 1¼d. per unit it was easy to work back the cost of the steam. It seemed to him that from the point of view of costing and taking the market price, the figure should be about 45s. per unit. If they could accept that, then the whole question of steam and power generation for the future would be solved.

Where Research is Needed

The Chairman remarked that they all tended to forget that waste heat steam was produced from very expensive fuel, and the direction in which real research was required was towards the development of new methods of heating without producing some form of waste heat. In their carbonising plant they got down to a very low output of waste heat steam, the fuel consumption being somthing less than 10%.

Mr. W. Morland Fox (W. J. Jenkins & Co., Ltd.) suggested that price was secondary to convenience. A proper balance of power and process steam was extremely necessary in every fuel industry and in every producing industry, and it was the keynote of the paper. He suggested that they were giving their rivals a subsidy by offering them power at their own price as opposed to selling it to them at the cost at which they were making it. Mr. Grant had made a point about the need for some augmentation in their winter load, but he regretted that he had not mentioned the Ruths or other type of steam accumulator, which he recalled that Mr. Birks had described long ago when he (Mr. Fox) was 'quite young.'

When talking about pass out or power process steam they seemed to have forgotten that they had already to hand a nice flexible, non-labour-using system. He referred to producer gas augmentation for the waste heat boiler.

Mr. L. J. Clark (Beckton) said that the question of steam and power generation had been debated in many directions in

the North Thames area, particularly since the war, and substantial improvements had been made. A scrutiny of fuel figures would show that in the last seven years the fuel consumption had been reduced by over 30% from 1.83 tons to 1.35 tons. Mr. Grant had been very modest in dealing with what had been achieved at Bow Common, and might almost be accused of hiding his light under a bushel.

Possible Coal Economy

A great point about Bow Common was that it started with being one of the most efficient stations in the country, with a fuel consumption of less than 10%. Mr. Grant was now up against the problem of having surplus waste heat steam at night time. His total fuel consumption was 2.3 cwt. per ton, which was about half the national average. If other plants could be brought up to the Bow Common standard they could save 2 mill. tons of coal a year.

While Mr. Grant had concerned himself mainly with problems of immediate concern the question of electrification must be a matter of long-term development. Regarding the use of turbo-alternators, he had referred to back pressure and pass out machines. When the time came the facts must be carefully weighed. He thought it would be found that pass out machines became rather inefficient if required to operate over a wide range of conditions. There was much to be said for running in parallel with the public electricity supply. The idea of the electricity supply industry taking the balance of the gasworks electricity load was the right one. Their diversity was so tremendous, even if the gasworks should have a breakdown, that they could meet any emergency. Having a national supply, there was great advantage in having that diversity. He thought the electricity industry was working in the right direction in offering the gas industry something a little more favourable than before. The value of fuel saving in the generating stations was being passed on to the gas industry as consumer. 'We are making progress in many directions,' added Mr. Clark, 'and I think, as Mr. Birks has pointed out, we should take the overall national point of view into account.'

Mr. Grant Replies

Mr. Grant, replying briefly to the discussion, said he felt it was an achievement to have convinced Mr. Birks that the agreement with the British Electricity Authority needed some modification; that alone had made the preparation of the paper more than worth while. It was decidedly encouraging to think that the plant at Bow Common had only 13 years to run, and that they could then scrap the lot, instead of asking the Chief Engineer for small improvements. Mr. Herbert had appeared to assume that there was a wide range of control over the heat input to the boiler, but the fact was that the heat was there, whether they used it or not. If they stuck a bundle of pipes round the boiler the steam was there; otherwise it went up the spout. The heat input to the boilers could be reduced only in close relation to the extent to which they could reduce the fuel requirements for the carbonising process.

He agreed that there were other means of utilising the waste heat, but he did not know of any local people anxious to take heat from the Bow Common works in the ways Mr. Herbert had suggested. With regard to process steam for water gas plant, the blowers were electrically driven. The plant was not modern and there was no point in making it an up-to-date mechanised unit, and therefore there was no prospect of using low pressure steam in the way suggested. Regarding diesel generators, they had used a diesel for air compression, but they were still up against the problem of using waste heat for making cheap steam, and therefore for making power. Generally, the generation of power for internal use by means of independent diesel generators was very favourable.

Replying to Mr. Dawson, Mr. Grant said a lot of people were suspicious of waste heat steam. It was something they got for nothing, and therefore they did not think it was as cheap as it appeared to be on paper. But as he had said in reply to Mr. Herbert, if they put a bundle of pipes surrounded by water in the path of the waste gases they were bound to get steam which would otherwise be wasted up the chimney. He agreed that it was necessary to be absolutely sure of their basis of costing. He had taken note of Mr. Morland Fox's remarks about the Ruths accumulator, but he pointed out that their present steam generating pressures were so low that there was no scope for the use of such accumulators. Producer gas augmentation was all very well, but he wondered what would happen if the turbine packed up.

He thanked Mr. Clark for his comments, and said that so far as they could see they were not likely to save much more fuel as a result of electrification, except perhaps through improving the efficiency of the retort settings. He had hoped there would be some comment on running in parallel and the insertion of reverse power relays in the incoming supply. He wondered what would happen if there were a sudden change in demand—more particularly from the point of view of the unskilled electricians or shift attendants on the plant.

Dr. Burns remarked that the total cost of power production was 0.3d. per therm. By making a complete investigation and adopting all possible improvements it might be possible to reduce the cost by 0.1d. The National Coal Board might then come along and increase the cost of coal by anything up to 10s. a ton, and up would go the cost of gas immediately by 1d. a therm. He saw a glimmer of hope, however, in the suggestion that they might save 2 mill. tons of coal a year by improvements suggested by Mr. Clark.

A vote of thanks was accorded to Mr. Grant on the proposition of **Mr. S. Langford,** seconded by **Mr. K. L. Clark.**

OIL FROM COAL

It is hoped to be able to start up the first section of the Sasol oil-from-coal undertaking at Sasolburg, Orange Free State, towards the middle of 1954. The South African Coal, Oil & Gas Corporation, Ltd. (SASOL) was established in September, 1950. Originally estimated to cost £13 mill., it is now expected that the SASOL enterprise will cost considerably more than that, probably in the region of £30 mill. An amount of £25 mill, has been voted for the project, and paid-up capital now stands at £12 mill. Much of the increase is due to the fact that the plant will have a very much larger output than that originally planned—70 mill. gal. of oil products per annum as against 30 mill. gal. A ton of coal can be mined in South Africa for as little as 6s., and it is estimated that this can be converted into fuel and chemical products to the value of £3 5s.

The plant is 50 miles from Johannesburg and 15 miles from Vereeniging, consideration being given to the advantage that the plant would be situated on the top of a vast coalfield and on the banks of the Vaal River, South Africa's main source of water supply. Thus it will have its two main raw materials right to hand and, in addition, will be within easy distance of the country's largest consuming centre. Extraction of oil from coal will be by the Fischer-Tropsch process. The estimated main products to be manufactured at Sasolburg are 55 mill. gal. of petrol, 4,500,000 gal. of diesel oil, and 1,800,000 gal. of fuel oil per year. The by-products will include 9,000 tons of ammonia, 2 mill. gal. of low-temperature tar, and 14,000 tons of paraffin waxes of various types.

When the plant is in operation, six Linde oxygen units will be producing 1,500 tons of oxygen, mainly for the gasification plant. The gasification section will treat 3,200 tons of coal per day.

The SASOL plant will be supplied with coal from Sigma Colliery, situated about two miles away. Three coal seams have been proved, the upper seam at a depth of about 370 ft. having an average thickness of 11 ft. The middle seam, at a depth of about 420 ft., is 24 ft. thick. Below this is a thinner seam which occurs only over part of the SASOL area.

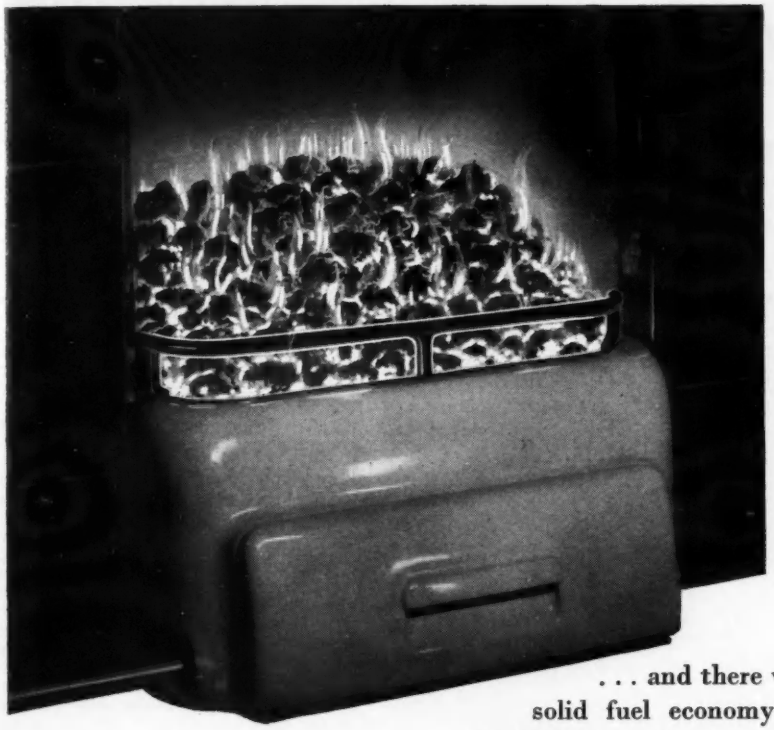
A 15-ft. dia. concrete-lined ventilation shaft has been completed, together with a second shaft for winding men and materials. An incline drift, 20 ft. by 9 ft., some 1,450 ft. long, was completed recently in the record time of 13 months, despite the fact that the whole length had to be concrete lined. This drift, which dips at a very low gradient, will be equipped with a 48-in. wide conveyor belt, capable of carrying 650 tons per hour, which will bring the coal to the surface and convey it to the factory. It is unlikely that any further shaft-sinking will be necessary in the future, in spite of the large area of the coal deposits.

The mine will be one of the most highly mechanised pits in the country and will employ only 28% of the European and 15% of the native labour necessary in a conventional mine. A multiple eight-entry system will provide a high initial tonnage as well as an adequate system of ventilation. The mine will be blocked out in panels each of which will independently furnish the plant with one year's supply of coal.

The coal will be crushed underground before being fed on to the incline conveyor, thus ensuring a steady flow of coal to the surface and eliminating damage to the conveyor belt.

TILL FURTHER ORDERS

Members of the Gas Council Dramatic Society will take the stage again on February 24 when they present 'Till Further Orders' at the Rudolph Steiner Hall, 33, Park Road, N.W.1, at 7.15 p.m. The players rehearse in their own time, and the producer this year is not a Gas Council employee. Seats are obtainable from Miss J. Bolton, 1, Grosvenor Place, S.W.1, at 7s. 6d., 5s., 3s. 6d., and 2s. 6d.



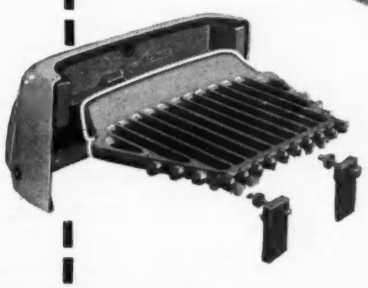
There's more cold weather on the way . . .

. . . and there will still be a big demand for solid fuel economy grates. Meet it with the NEWBOLD—the grate that gives maximum radiation at hearth level.

The NEWBOLD

ECONOMY GRATE

- FITTED WITH GAS ATTACHMENT
- BURNS COKE—THE CLEANEST OF FUELS
- EASILY CLEANED
- SAFE, EFFICIENT AND ECONOMICAL
- EASILY AND QUICKLY INSTALLED
- PERFECT CONTROL FOR FAST OR SLOW BURNING
- NO COSTLY REPLACEMENT OF FIREBRICKS
- WILL PLEASE AND SATISFY YOUR CUSTOMERS



The above illustration shows the Newbold with deepening bar removed and the safety plate in position for all night burning. On the left is shown the very simple construction. The hearth can be easily cleaned by lifting out the grating and supports complete.

FLAVELS *of* **LEAMINGTON**

★ *Approved by the Min. of Fuel & Power*

· MAKERS OF FINE COOKING AND HEATING APPLIANCES SINCE 1777 ·

Consultative Council Meetings

NORTH EASTERN

Safety Precautions

MEMBERS of the North Eastern Gas Consultative Council at a meeting at Leeds on January 11 approved the steps taken by the Gas Board to decrease the number of accidents caused by faulty gas appliances and fittings. Consumers in the area will in future be reminded of the procedure they should take if they find any faulty fittings. Warning notices in the form of stick-on labels will be attached to prepayment meters and quarterly accounts. The Council had suggested to the Board that notices should be displayed in gas showrooms and offices, but after consideration it agreed that the label method would be better.

The Council decided to take no action on a resolution, on the report of the Ridley Committee, urging that an advisory committee be set up to study gas tariffs. A request for support came from the South Western Gas Consultative Council. The Council also agreed to take no action in supporting another resolution from the Eastern Gas Consultative Council—that the Ridley Report be implemented by the Government and a national fuel policy be put into operation without further delay, and that a letter be sent to the Minister of Fuel and Power on these lines asking for his observations on it, in time for the next meeting.

Commenting on the annual report of the Board, Alderman H. Sutcliffe said that the greater efficiency in plant had resulted in more gas for less coal. He had found complaints were attended to more promptly, and there were fewer of them. The Board's overhead expenses had increased by over 20% in one year, and although this was no reflection on the Board, as this was due to wage increases and raw materials, he noted that there was no increase in gas sales. This was due to the weather, however, and the Board could not be held responsible for that. 'But,' he continued, 'expenses may still rise and we may find it is costing more to sell gas than to produce it.'

Dr. R. S. Edwards, Chairman of the Board, thanked members for their complimentary remarks and said that the improved results were due to the real effort put in by the staff of all ranks. They were now finding definite advantages from production economies, and there were more to come.

Replying to a question raised by a member of the Council regarding the Tingley and Bradford works, Mr. G. E. Currier, O.B.E., Deputy Chairman of the Board, said the Board had never shut down any undertaking without having absolute economic grounds for doing so. The Tingley results were now as efficient as any modern plant could give, and quite as good as they had anticipated. The Tingley works had established a reputation for coke already, which was in great demand. Although the quality of coal they were receiving was not quite as good as pre-war, it compared favourably with any coal supplied in the country.

EASTERN

Tariff Problems

DISCUSSION at the bi-monthly meeting of the Eastern Gas Consultative Council in London on January 18 was concerned mainly with a report from the Tariffs Sub-Committee, which consists of Alderman R. Turner (Chairman of the Consultative Council) and the Chairmen of the five divisional committees. It was reported that at a meeting in December the sub-committee had considered suggestions by Mr. C. H. Frewer (Chairman of the Norwich Divisional Committee) regarding the all-purposes non-domestic block rate tariff. His main suggestion was that for consumptions of from 5,001 to 7,000 therms per quarter there should be a discount of 4½d. per therm; for consumptions of 7,001 to 10,000 therms per quarter, a discount of 4¾d.; and for consumptions from 10,001 to 15,000 a discount of 5d. There was also a proposal to introduce further concessions for consumptions between 50,001 and 100,000, and a final block for consumptions over 100,000 therms per quarter.

It was pointed out in a letter from the Chief Accountant of the Eastern Gas Board that the Board was not certain, without taking out detailed statistics of consumption per consumer, whether the adoption of Mr. Frewer's suggestions would involve the Board in a loss of revenue. Such a loss could not be faced at present without a prospect of recovering it by an increase in price to the domestic consumer. It was the Board's considered opinion that it would be inadvisable at present to vary the discount blocks or methods of applying them unless it was accompanied by a change in gas prices.

The Chairman, in presenting the report, said it was interesting to read in the report of the Productivity Team which visited the United States in 1952 that 'tariffs generally are almost all on the block system, with the first blocks as the minimum charge.' The disadvantage of the present system of a pence-per-therm discount only existed while the flat rates were at variance. There was a tendency for prices to get nearer together, for instead of the 66 flat rate prices which were in existence at vesting date, the number was now reduced to 11. If in time the flat rate prices became uniform in the divisions, then the present price per therm discount would prove an ideal arrangement.

Mr. Frewer said the matter of discounts had not yet been finalised, and the sub-committee had asked for certain information from the East Midlands Gas Consultative Council, in whose area reductions in price had recently been announced. The sub-committee had been told by the Chairman that 'some consultative councils had set up an industrial committee, but the Eastern Gas Consultative Council had felt that its tariffs sub-committee was quite capable of dealing with industrial problems and did not think it necessary to set up a special committee for the purpose.' His own view was that the tariffs sub-committee should have the benefit of the views of members representing industry. Each of the divisional committees had one member or more than one nominated by the F.B.I. or other similar body, and he thought such members should be included in the tariff sub-committee.

Alderman Turner recalled that some time ago he put before the Council a letter from the Minister of Fuel and Power inviting it to set up an industrial committee. It was decided not to set up such a committee, but each divisional committee was strengthened by the appointment of a nominee of industry.

Objection was made by other members that if representatives of industry were to be co-opted on the tariffs sub-committee, trade union representatives should have equal facilities for discussing tariffs. An alternative suggestion was that the representatives of industry might regard themselves unofficially as an industrial tariffs committee, but this was ruled out as unconstitutional. Ultimately it was agreed that when the tariffs sub-committee deemed it necessary or desirable it should call in one representative of industry.

Ridley Committee

The Chairman reported that five other gas consultative councils had stated that they were in general agreement with the Eastern Consultative Council's views on the Ridley Report. There were 40 recommendations in the report and a survey had revealed that 20 of them were now in operation. As a matter of fact few of them really affected the work of the gas consultative councils. One of the recommendations which the Council had specially commended to the Minister was that advocating the formation of a joint fuel and power planning board. As already announced, the Government had decided that co-ordination could best be assured through a Minister's co-ordinating committee, consisting of himself and the Chairmen of the National Coal Board, Gas Council, and British Electricity Authority. That committee was now in operation.

Allowance on Old Appliances

The Council had asked the Eastern Gas Board whether some standard allowance could be made on old appliances when new ones were installed, as was the case in the area of the North Thames Board. The reply was that if an allowance was made it would reduce the on-cost margin. It was further pointed out that in a recent cooker campaign the Board set a target of 12,000 and it had already sold 15,000 cookers, a figure which hardly suggested that the Board's policy was bad.

Members insisted, however, that the Board was 'flying in the face of established business practice' in not allowing anything on old cookers, and it was agreed to ask the Board to give the matter further consideration.

Two letters were received from Mr. H. B. Paten, of Peterborough. In one he drew attention to the price decreases in the East Midlands area, which he felt sure would encourage the Eastern Gas Consultative Council to make a deter-

mined effort to persuade the Eastern Gas Board to move in the same direction. In his second letter he felt there was no doubt that his comments of a year ago were coming true, namely, that the law of diminishing return was beginning to apply and unless the gas industry was prepared to recognise that, it was in his view in for increasing difficulties. For example, he quoted coke. He said apart from its price it had the great disadvantage of creating dust and dirt and his own board after careful consideration of the situation had had to put in two oil-fired burners in two of their hotels. This decision was due to a variety of considerations of cost which was not confined just to the visible cost, but also to the question of dirt. etc., and to the great difficulty of getting hotel staff to run a coke-fired boiler efficiently. On the result of the oil-fired burners their future policy would be decided and although it was only a small thing, it was a trend which could not be overlooked and it might well mean that owing to the very high price of coke this tendency would go on, particularly in the hotel and domestic field. He felt the law of diminishing return could not and must not be overlooked. He suggested that one of the duties of the industry during the coming year was to cut costs and increase efficiency, and not to put up prices the first time charges went against them. He realised this all sounded very easy, but was certain this should be a matter of high policy.

Maintenance of Appliances

The Norwich Divisional Committee reported that in reply to a resolution on the maintenance of appliances, the Committee had been informed by the Gas Board that very few appliances on hire purchase contract were the subject of a separate maintenance or servicing contract, in that it was the Board's policy to undertake normal servicing of appliances on hire purchase without charge during the period of contract. There might be a few cases, but these would not increase in number as the trend towards a uniform practice in this matter grew. Should a case arise in the future, however, where a hire-purchase appliance, the subject of a separate maintenance contract, was transferred to a second consumer, arrangements would be made for the maintenance contract to be continued.

The Board was alive to the need for a first-class service of maintenance for its consumers, and the position was under constant review by its sales and service officers. Nothing would be more harmful to the Board's reputation for good service, or a greater disservice to the consumer, than the introduction of a system of contractual maintenance available to all consumers without the required number of skilled fitting staff to carry out such contracts.

Although at the moment the Board could not contract to make regular calls on all consumers, its employees who visited consumers were instructed to point out any defects in apparatus where apparent, and on instructions from the consumer the Board would carry out necessary repairs at the cost to the consumer where chargeable. The Board was willing and anxious to give consumers the best maintenance service it could within the limits imposed by the present size of its fitting staff and the call made by the extensive housing development in the area on the staff's time.

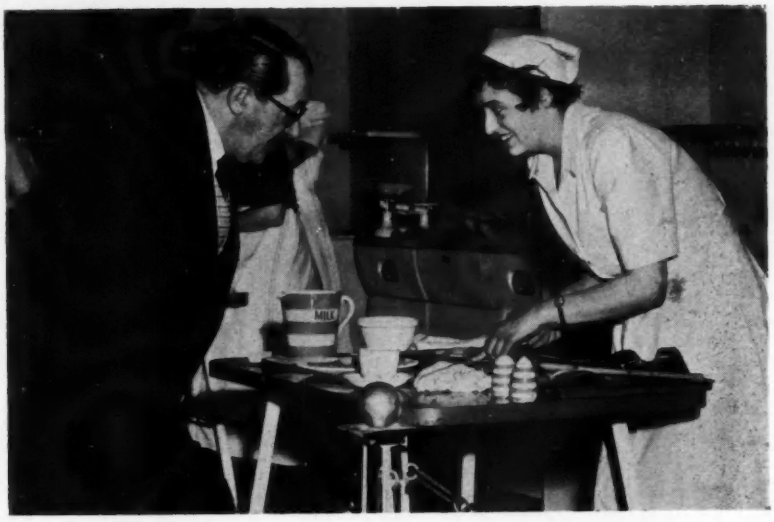
NORTH WESTERN COOKERY FINAL

Before an audience of 1,200 in the Free Trade Hall, Manchester, on January 20 Mr. Gilbert Harding presented the prizes to the area winners of one of the biggest cooking contests ever publicly staged in this country. The contest was the last of a series of eliminating heats, held by the North Western Gas Board, in which more than 2,000 young people, aged between 15 and 19, competed for the honour of representing the North West in London in April at the finals of the 'Youth in the Kitchen' competition.

At the Manchester contest, the 17 semi-finalists from the group regions of the Board cooked throughout the morning in 17 model kitchens ranged around the main hall. Each had to prepare a full meal for four people from the same amount of ingredients, but the competitors were free to choose what they would like to prepare. Such a great variety of dishes in fact was served up that the judges' task was difficult.

Miss Gwynneth Llewelyn Williams was first prize winner, and she will travel to London in April to compete against the winners of the other 11 gas board contents for the championship. The meal she prepared was: Lamb cutlets, spring cabbage, creamed potatoes, and lemon meringue flan. The second and third prize winners respectively were Barbara Cartledge and Eileen M. Markland.

The prizegiving ceremony was followed by a fashion parade at which Mr. Herbert Sidon, of London, presented a collection of 'Debrett' cocktail frocks which he is taking on a tour of the capitals of Europe, and Hector Powe, Ltd., presented a collection of new tailored suits for women. The commentary on the fashion parade was given by Miss Mary Hill, of television fame.



Mr. Gilbert Harding, with Miss Mary Harrison, of Whitefield, one of the 17 competitors in the North Western Gas Board's 'Youth in the Kitchen' cookery competition. The contest was the last of a series of eliminating heats in which more than 2,000 young people took part.

A feature was a full dress parade of the Board's 69 home service advisers in their white uniforms and head-dresses, bearing pennants which carried the name of the towns in which they are stationed. The parade was led by Miss Hilda Swindells, chief home service adviser, and was played on to the stage by pipers.

The fitting of gas to the 17 model kitchens was completed in record time by a picked 'commando' of plumbers, captained by Mr. Norman Poole, under the direction of Mr. A. Harrison, Group Sales and Service Officer of the Board's Manchester Group.

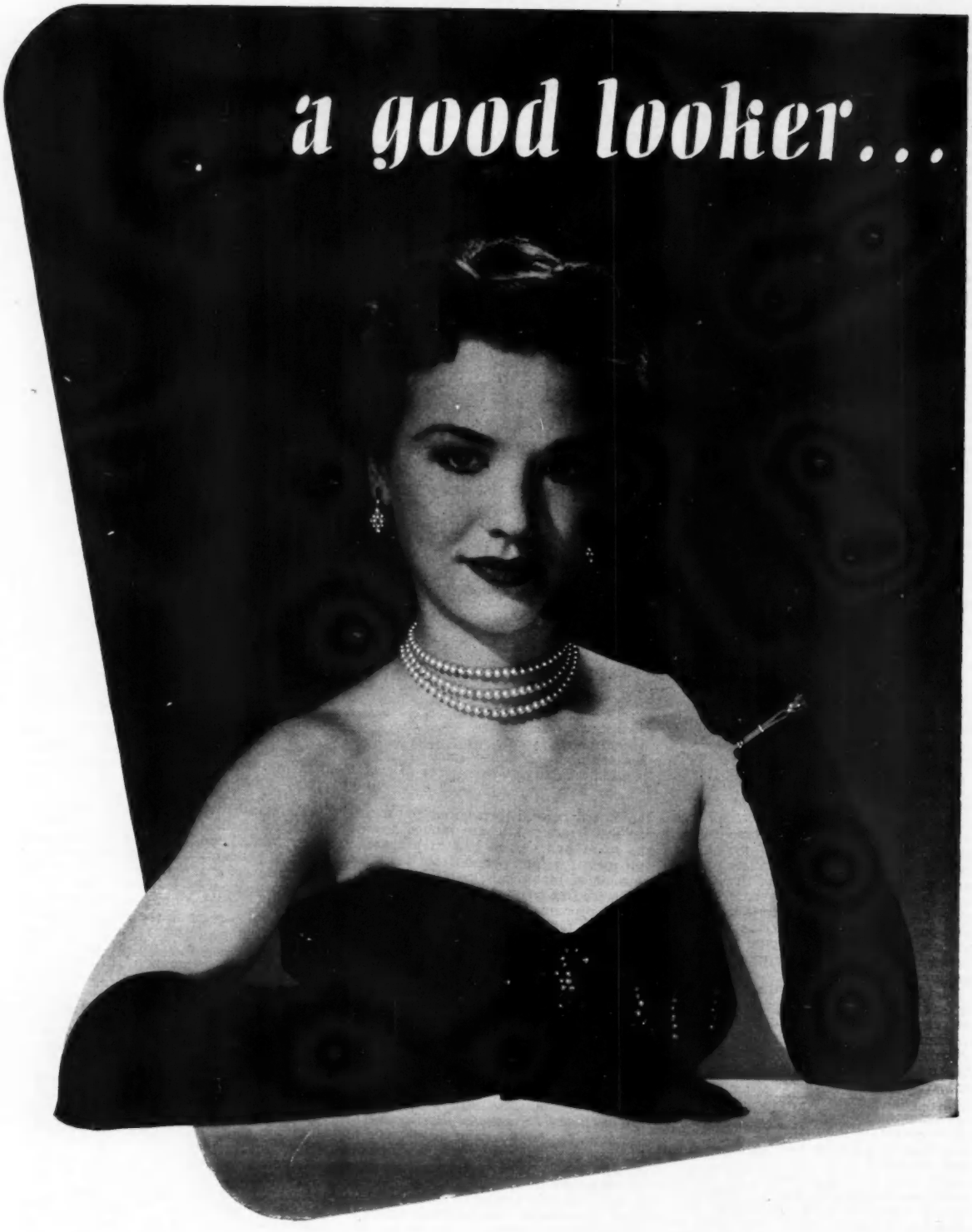
Films for Industry

MR. HENRY STRAUSS, Parliamentary Secretary to the Board of Trade, said in London on January 18, that the problems of productivity in industry must be solved by industry itself, 'but there are ways in which the Government can help.' He was introducing the 1954 catalogue 'Films for Industry,' issued by the Central Film Library of the Central Office of Information (price 1s. 6d. net).

The 16 mm. films available from the C.O.I. include one dealing with heating research for houses and many on fuel economy. Most of the productions are designed to help train skilled and unskilled workers to carry out tasks with the maximum efficiency.

Flue gas analysis, boiler house practice and the smoke eliminator door are some of the subjects dealt with, and films on staff management are plentiful. 'Introducing the New Worker,' for example, was shown at the viewing. This supervisory training film shows what happened to young Joe, who came along to his new job brimming with enthusiasm, but in a few weeks, through slack treatment, was in the depths of depression. Young Joe is played by Harry Fowler, a British star well known as an actor invariably playing the part of a youth who intends to make good but inevitably makes bad. It is a worthwhile film for management who wish to keep their staff.

The catalogue includes 200 American films, 50 British films, and others from Europe and the Commonwealth.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and a fine cooker

the MAIN No. 20

CENTURY

GAS COOKER

Clean design and vitreous enamelled surfaces throughout—exterior finished in cream • four dual-purpose hotplate burners—all can be used for fast-boiling or simmering • large griller with grill pan and crosswire grid • hotplate fittings can be easily removed for cleaning • hotplate-well free from projections and dirt traps • safety-type gas taps • double-shelf plate-rack • roomy oven giving high-quality cooking performance with minimum gas consumption and with easy-to-clean rounded corners • Mainstat oven heat control • flash tube lighting to oven burner • drop-type door allows maximum light to enter oven • used oven heat vented in front of backplate and warms plate-rack • storage space in plinth base • hotplate side extensions and gas lighter supplied if required.

The Century cooker combines efficient performance with ease of cleaning.

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Institution of Gas Engineers

Supplementary List of Successful Candidates

THE following supplementary list of successful candidates in the 1953 examinations of the Institution of Gas Engineers incorporates a list of the candidates who have been awarded the Certificate in Gas Salesmanship and Consumer Service.

Associate Membership Examination: Gas Engineering (Manufacture). Gadsby, A. F. W. (Southall).

Higher Grade Examinations.—This list includes candidates, who, having previously passed the main subject examination, have now qualified for the award of certificates by completing outstanding ancillary subjects. *External Candidate, Gas Engineering (Manufacture):* Bardell, G. A. (Salford). *Internal Candidates, Gas Engineering (Manufacture):* Harvey, D. W. (Plymouth), Heathcote, E. E. (Manchester), Paine, R. E. A. (Westminster), Walton, A. (Newcastle-upon-Tyne).

Gas Engineering (Supply): Cooling, C. G. (Brighton), Freestone, W. C. (Brighton), Kitching, D. (Westminster), Whittaker, W. P. (Manchester).

Ordinary Grade Examinations.—The Ordinary Grade examinations terminated in 1951, but the following internal candidate who passed the main subject examination has since qualified for the award of a certificate by completing outstanding ancillary subjects. *Gas Engineering (Supply):* Rowley, S. G. (Newcastle-upon-Tyne).

All the following candidates gained certificate in gas salesmanship and consumer service.—*First Class:* Blott, L. S. H. (London), Bonner, A. H. (London), Coburn, R. T. (Southend-on-Sea), Jamieson, G. R. (Potters Bar), Jeffery, D. H. (Keston), Jones, J. H. (London), Obbard, J. A. (London), Parkes, J. S. R. (London), Rutt, A. H. (London), Smith, A. (Edinburgh), Smith, D. (Leeds), Stevens, R. J. (London), Weeden, A. S. (London).

Second Class: Ballard, R. (London), Barge, H. J. B. (Westcliff-on-Sea), Carling, J. (London), Caton, J. A. (London), Coombes, S. J. (London), Douch, C. A. (London), Duerdoth, E. E. (London), Eldridge, S. J. (London), Ellis, E. A. C. (London), Halsey, L. E. R. (London), Hughes, A. S. (London), Hughes, E. I. (Bexleyheath), James, R. H. (Romford), Johnson, R. H. (Potters Bar), Jones, S. H. (Worthing), Lambert, K. (London), Lee, S. E. M. (Brighton), Marshall, L. L. (Shirley), Miles, A. J. (Woodford Green), Mills, L. J. (West Croydon), Nicholson, H. W. C. (Bromley), Potts, R. E. E. (London), Roby, G. E. (Southall), Simmons, J. R. (Worthing), Tamea, D. J. (London), Taylor, E. J. O. (Banstead), Thompson, K. W. (Croydon), Tyler, D. S. (East Barnet), Vale, A. J. (Rotherham), Willis, D. R. (Wembley), Windus, A. G. (London), Young, A. J. (London).

Report of the Sales Training Committee

The membership of the Sales Training Committee is as follows: *Chairman:* J. H. Dyde, M.SC.

Gas Education Committee Nominees: H. P. Lupton, B.SC., W. K. Tate, M.A., J. Tudor Rees, J. Terrace.

Gas Council Nominees: A. B. Badger, M.A., PH.D., F. A. Cheeseman, R. N. Le Fevre, A. McDonald.

Ministry of Education Nominees: F. Caunce, H.M.I., C. E. Beevers, H.M.I.

Incorporated Sales Managers' Association Nominee: C. C. Knights, F.S.M.A.

There have been some changes in the membership of the Committee during the year as a result of the resignations of Mr. A. B. Seton, Dr. P. C. L. Thorne, and Mr. R. J. Morgan, all of whom had served on the Committee since its initiation. The vacancies have been filled by Mr. F. A. Cheeseman, Mr. F. Caunce, and Mr. C. C. Knights.

Reference was made in the Report of the Committee for the year 1951-52, included in the 29th Report of the Gas Education Committee (Comm. No. 414), to negotiations with the City and Guilds of London Institute in connection with the revision of the examination arrangements for the Certificate in Gas Technology (Supply). These negotiations have been satisfactorily completed and candidates for the Certificate in Gas Salesmanship and Consumer Service are now required to take only Part I of the examination in Gas Technology (Supply), the syllabus for which relates to domestic utilisation and has no reference to industrial and commercial utilisation of gas or to distribution engineering. It is emphasised, however, that although the syllabus has now been restricted to the fields in which candidates are likely to have had practical experience, there is to be no lowering of the standard of achievement required.

Oral Examinations, 1952

The oral examinations of successful candidates in the written examinations in 1952 were conducted in October and November at four centres. A subsequent meeting of the examiners indicated that in each case the procedure adopted was practically identical and consisted, for the greater part, of a test of the candidates' ability to demonstrate and sell gas equipment. The regulations for the Certificate in Gas Salesmanship and Consumer Service provide that oral examiners may raise or lower the standard of achievement in the written examinations as a result of the oral test, success in which is essential for the award of a certificate. In the examinations conducted in the autumn of 1952, 36 candidates having satisfied all of the requirements for the written examinations were orally examined. Eight passed 1st class, 17 2nd class, and 11 failed. There were four cases of candidates whose achievements for the written examination were of 2nd class standard but who, by reason of their excellence in the oral examinations, were awarded 1st class certificates.

Written Examinations, 1953

For the written examination held in April, 1953, the Committee re-appointed the examiners who conducted the examinations for the last two years (Mr. C. C. Knights and Mr. S. A. King). The number of candidates entering for the examination was greater than on the last occasion, but the general standard was not as high, although the results would not be considered unsatisfactory when compared with those obtaining in other examinations at the present time.

Claim Against Gas Board

MR. JUSTICE LYNSKEY held in the Queen's Bench Division on January 20 that Colonel Richard H. Studholme, solicitor, Pembroke House, Send, Woking, was not entitled, as he claimed, to a proportion of the capital of the South Western Gas Board as his fees under an agreement for services between April 1, 1949, and March 31, 1951. On the basis of an admission by the Board that he was entitled to reasonable remuneration for the period in question, however, judgment was given for the plaintiff for £3,222 5s. 4d.

An agreement between the plaintiff and the Severn Valley Gas Corporation in 1938, as later amended, provided that he should perform legal and administrative work and receive, as remuneration, a retaining fee calculated at the rate of £600 a year per million pounds of the issued share and loan capital of the Corporation at the end of each financial year. On May 1, 1949, the rights and obligations of the Corporation became vested in the South Western Gas Board by virtue of the Gas Act, 1948. The plaintiff claimed that he was accordingly entitled to a retaining fee from the Board of some £10,020 a year, that remuneration being the due proportion of the total issued share and/or loan capital of the Board.

In the course of his judgment, Mr. Justice Lynskey said he was sure that the suggestion put forward on behalf of the plaintiff was never envisaged by those who drafted or passed the Gas Act. As the Corporation was dissolved by the Act there was thereafter no issued share or loan capital and nothing on which the plaintiff's retaining fees could be calculated. The Board's obligation became, as a result, impossible of performance, and, therefore, became frustrated as from the vesting date.

The defendants, while denying that the plaintiff was entitled to any remuneration under or by virtue of his agreement with the Corporation, had admitted that he was entitled to reasonable remuneration for the period in question—namely, £3,222 5s. 4d. In view of that admission, the plaintiff was entitled to judgment for that sum against the defendants.

His Lordship added that if he was wrong in his view, the question would arise as to what was the issued share and loan capital of the Board. He concluded that the statutory debt owed by the Board to the Gas Council was a funded debt; and the credit obtained had the character of borrowed money. It seemed, therefore, that the Board's responsibility to the Council for the sum of £3,500,000, provisionally allocated for paying overdrafts of former undertakers whose assets had been transferred to the Board, must be loan capital.

Elliott Brothers (London), Ltd., manufacturers of electrical, electronic and process control instruments, announce the transfer of their Manchester branch office to 66, Deansgate, Manchester 3 (T/N. Blackfriars 7752). Fisher Governor Co., Ltd., manufacturers of automatic control specialities, who are associates of Elliott Brothers, will also operate in the Manchester area from that address.

County Gasworks to be Built at Truro

THE first turf on the site of a new super-gasworks at Truro to supply gas throughout Cornwall was cut by Sir John Carew Pole, Chairman of the Cornwall County Council, on January 19. It is hoped that in three years a disused quarry at Newham, on the outskirts of Truro, will have given place to one of the most modern gasworks in the country. Sir John used a stainless steel spade inscribed with his name, and he handed back the spade, which will be kept so that he may plant the last tree to make the undertaking a pleasant site from the Truro River. As he walked away with the Mayors of Cornish towns and Chairmen of urban district councils whose areas will be served by the new works, a bulldozer began clearing the site.

Mr. C. H. Chester, C.B.E., Chairman of the South Western Gas Board, stressing that he thought the design would fit into the development of Truro and benefit the city and county, said it was a unique occasion for a gas engineer, because few of them had the opportunity of beginning the building of a new gasworks on virgin soil. It would be a modern works with the latest construction and would have an efficiency in the region of 80% to 85%. It would save something like 50,000 tons of coal a year—more than enough to pay the interest and capital charges.

At an inaugural luncheon in the Red Lion Hotel, Mr. Chester reiterated that the day was a milestone in a gas engineer's life. Despite its being 150 years of age the industry was a very virile one, and they remembered that it was started in Cornwall—at Redruth by William Murdoch. 'We shall have no-one to blame if we do not make a good job of this undertaking for we have had every help from everyone in this room,' said Mr. Chester. The new project should be completed by 1956. The multitude of small works in Cornwall were working at about 40% efficiency, but the new works would guarantee an efficiency of 80%. It would certainly cost money, but the saving in production costs because of the increased efficiency and the better quality by-products was bound to be of benefit to the consumer. It would take about £500,000 to complete the first stage before 1956 and the final cost would be about £1 mill. The whole system of Cornwall would be integrated with the other big centres so that by 1960 there would be a grid system operating throughout the South West, each giving an interchange of gas.

Service to Consumers

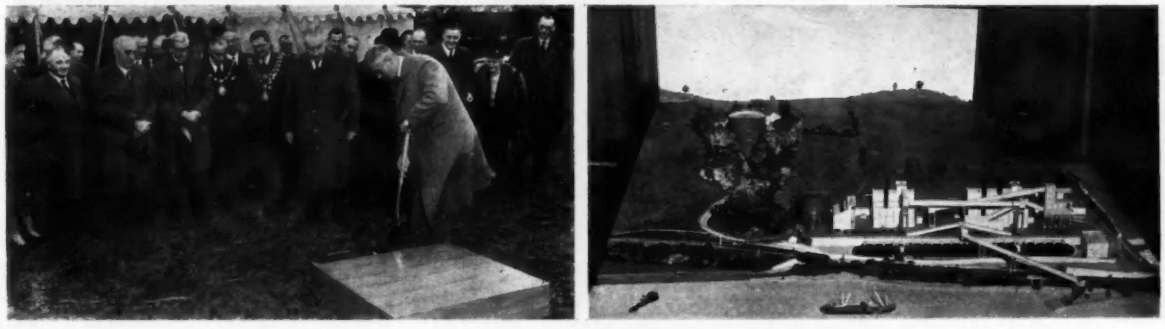
Dealing with service to consumers, Mr. Chester said they had decided at vesting day upon a policy of decentralisation, except for production and administration. Now they intended to decentralise further. Instead of 11 consumer service centres, they intended to have 30, each controlled by an expert who would be there purely to advise the consumer. 'It is no use saving money unless you get increased efficiency,' he added. 'We are determined to give the best possible service and in Cornwall we set, at vesting day, a ceiling price and we have kept it there. We are taking a long-term business view and hope that with increased efficiency and bigger sales we shall make Cornwall a profitable area.

'We are, quite unfairly, as a nationalised industry—and I believe there is some political aspect in this—accused of having hordes of increased numbers of officials. I want to give the lie to that at once. We had, last year, 400 less than the year before when we had 600 less than the year before that. The gas industry, I claim, is run in this area by people who know their jobs.'

Replying to the toast to the County of Cornwall, Sir John Carew Pole said they had made a real and human connection with the Gas Board. 'In these days there are so many files, letters, and inhuman, impersonal, dull, and cold connections between people that it is refreshing to find human contact which obviously leads to efficiency.' Sir John recalled that in 1951 the Gas Board wanted to extend its present works at Truro, but the planning committee felt it would obscure the view of the Cathedral and overshadow the town. The Gas Board agreed not to lodge an appeal, thereby saving public money on an enquiry. Instead, it met Truro City and County Council officials and found the new site at Newham. 'It is served by rail, road and water; there is a quarry to help hide the vast gasholders and I think that no better site could have been found,' he said. 'It is an ideal example of success being achieved by personal co-operation between local authorities and a nationalised undertaking.'

The Board's programme for supplying gas throughout the area from a few large stations to replace the old system of separate stations for each town was outlined by Mr. C. H. Chester, Chairman of the Board, when addressing the Cornwall County Planning Committee at Truro on January 18. He said that in 1954 and the ensuing two years between 40 and 60 small undertakings would be closed down, in addition to the 15 previously closed. By 1960 the manufacturing stations for the whole area, which extended from Chipping Campden to Land's End, would be reduced to 18.

The principal station, Bristol, would be completed this year, and Exeter and Truro by 1956. Re-organisation would mean changes in Cornwall, which would be embraced by the new Plymouth and Cornwall Division, under the management of Mr. J. W. Dean, who was at present Sub-Divisional manager at Plymouth. Mr. T. L. Tallentire would vacate his position as Manager of the South Cornwall Sub-Division to become Manager of the Cheltenham Division.



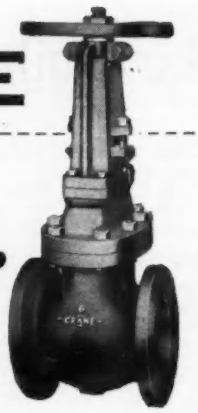
On the right is a scale model of the county gasworks project at Newham and on the left Sir John Carew Pole is seen cutting the first turf, watched by Mr. C. H. Chester, Chairman of the South Western Gas Board.

In addition to the inter-connecting of all the undertakings the Board's plans provided for the general extension of supplies, both along the routes of its integration mains and from the existing supply system in support of new industries and housing. With one or two additional items of plant the works at Penzance and Newquay would continue to supply gas into the grid for some years, and pending the completion of the new works at Newham, Truro, would provide sufficient gas to allow seven or eight more of the less efficient works to be closed down, and supplies from Plymouth should increase that number to 12 or more. Mr. Chester said that integration main-laying in Cornwall was proceeding rapidly. Twenty-five miles of the 168 miles required had already been laid. Improvements to the main system by the renewal of 17 miles of pipes and the clearing of a further one and a half miles had been completed, thus benefiting 10,500 customers.

The extension of supplies for new and existing housing, industrial and commercial consumers had accounted for a further 24 miles. In total since vesting day the Board had laid in Cornwall some 66 miles of mains, which could rightly be said to be a major contribution to a better planned community.

CRANE

VALVES for Gas, Steam, Water, Oil and Air



COMPRESSORS & EXHAUSTERS FOR AIR AND GAS.

See our Advertisement Next Week.

REAVELL & CO. LTD. IPSWICH.

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Quarterly Volumes of the 'Gas Journal'

5/- each, post free

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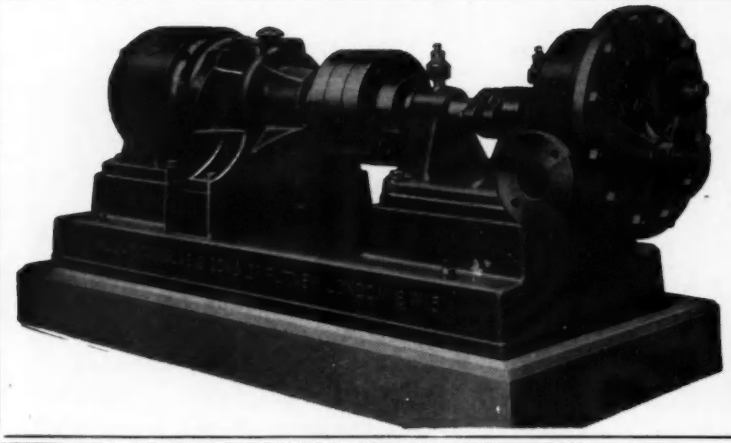

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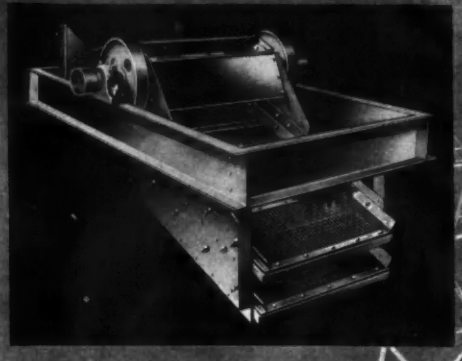
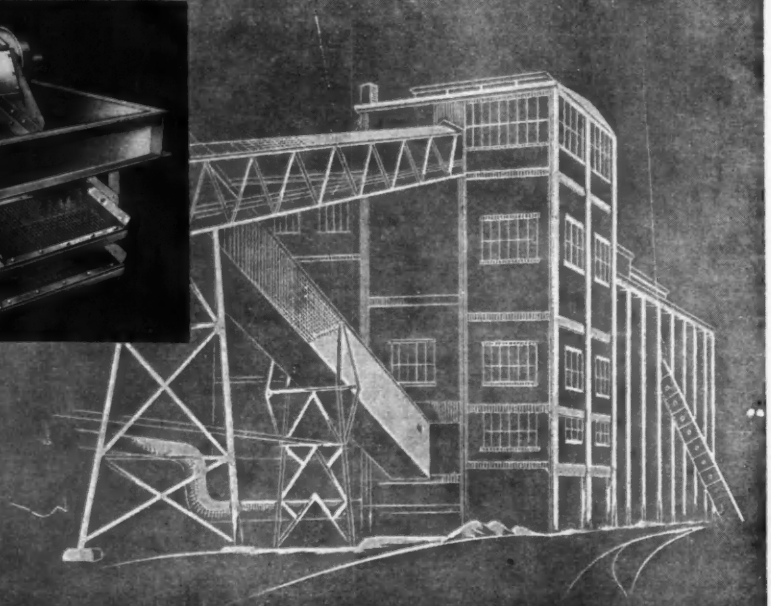
WILLIAM DOUGLAS & SONS LTD., PUTNEY - - LONDON, S.W.15.





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PEGSON LTD COALVILLE - LEICS - TEL: 234 LONDON OFFICE: IDDESLEIGH HOUSE - CAXTON STREET S.W.1. PHONE ABBEY 2373

SCOTTISH OFFICE: 7 LISTER ROAD, HILLINGTON INDUSTRIAL ESTATE, GLASGOW. PHONE: HALFWAY 1800. A Company of the Mellor Bromley Group.

● Illustrated below is the 100 cu. ft. model which can also be supplied with pressure-gauge on the inlet tube if desired.

IMPORTANT MEASURES

The "A & M" DRY TEST METER

For 'in situ' test of consumers is available in sizes ranging from 100 to 700 cu. ft. per hour.

Full details will be supplied on request.

ALDER & MACKAY LTD.

New Grange Works, Edinburgh

LONDON BRADFORD MANCHESTER BELFAST · CORK

ETHER Solenoid Valves ·

Safety Shut-off. Type H.A.C

ETHER Safety Shut-off Valves are manually opened and held open electrically. They close on current failure and remain so until manually opened.

They are used in conjunction with oil and gas burners to automatically cut off fuel and/or air supply in the event of faulty or dangerous operation.

Ether safety shut-off valves have many features ensuring trouble-free and lasting operation.

They are packless, explosion proof, noiseless and are liberally rated with low temperature rise. All valves give a 100 per cent. total shut-off of fuel. They are suitable for controlling most liquids and gases at low and high pressures.

● Ether shut-off valves, used in conjunction with Air Flow Switches and other accessories, provide the answer to most combustion safeguard problems.

Send for List No. 251

ETHER LIMITED

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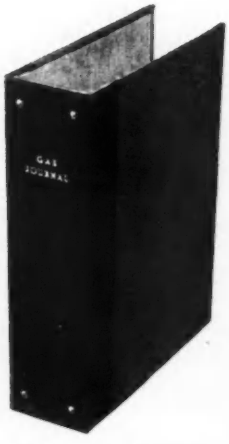
AMAL

Calibrated Jets & Injectors
to meet a specification of consumption

AMAL LTD., HOLDFORD ROAD, WITTON, BIRMINGHAM, 6

Bind your JOURNAL each week



Gold lettered on the spine complete with instruction sheet.

No loose copies to be mislaid

We offer Journal readers a simple method of temporarily binding their copies as received week by week. No time lost searching for a particular issue; Journals removed and replaced in a few seconds. Designed to hold 13 issues, and whether completely or only partially filled the book effect is always maintained.

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PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates: Home and Empire:—52/- per annum; Foreign:—60/- per annum. (Both payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 1/9 per line (approx. 7 words)—minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep × 7" wide; block screen 120.

BUSINESS MANAGER : S. T. CULLEN

MIDLANDS MANAGER: G. B. Torrance, 42, Wychall Lane, King's Norton, Birmingham, 30.

NORTHERN MANAGER: W. Q. Foster, 33, St. Helens Road, Harrogate. *'Phone:* Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: CENtral 2236-7. *Telegrams:* Gasking, Fleet, London.

OXIDE

DUTCH AND DANISH BOG ORE
SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright.
Highest prices paid for Spent Oxide.

Send your enquiries to

GAS PURIFICATION & CHEMICAL COMPANY LIMITED
ESTABLISHED 1873

PALMERSTON HOUSE, OLD BROAD STREET, LONDON, E.C.2.

Telegrams: "Purification, Stock, London." Telephone: London Wall 5077

FIRE! *QUICK!*
DEADLY SERIOUS BUT FOR
NU-SWIFT!

"The Police advised us to keep clear until the Fire Brigade arrived but, recharging Nu-Swift four times, I saved our home and business. 'What a wonderful job', said the Fire Brigade."

NU-SWIFT LTD · ELLAND · YORKS
In Every Ship of the Royal Navy

"KLEENOFF" *
THE COOKER CLEANER

"KLEENOFF"
FIBRE BRUSHES
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KETTLE DESCALER

For resale to the public, and in bulk for Works use.

BALE & CHURCH, LTD.
CROMPTON WAY, CRAWLEY, SUSSEX

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

WALES GAS BOARD
PORT TALBOT UNDERTAKING
DISTRIBUTION ENGINEER

APPLICATIONS are invited from suitably qualified persons for the appointment of DISTRIBUTION ENGINEER at the above Undertaking.

Applicants must be experienced in high/low pressure gas distribution and mainlaying, and should possess the Institution of Gas Engineers Higher Certificate in Gas Engineering (Supply), or an equivalent qualification. The person appointed will be expected to perform duties in connection with distribution work for other Undertakings in the Mid-Glamorgan Group.

The salary will be Grade A.P.T. X, Provincial 'A' (Scale—£665/765) commencing at a figure commensurate with qualifications and experience.

The successful applicant will be required to pass a medical examination and to join the Board's Superannuation Scheme.

Applications, stating age and experience, and giving full particulars of training and qualifications, together with the names of two referees, should be received by the undersigned within fourteen days of the appearance of this advertisement.

W. F. EDWARDS,
General Manager & Secretary.

Gas Offices,
18, Station Road,
Port Talbot.
January 22, 1954.

WALES GAS BOARD
DEPUTY ENGINEER & MANAGER—
RHYL, PRESTATYN AND ST. ASAPH
UNDERTAKINGS

APPLICATIONS are invited for the position of DEPUTY ENGINEER AND MANAGER of the Rhyl, Prestatyn and St. Asaph Undertakings.

Candidates for the appointment must have had administrative experience and possess appropriate technical qualifications.

The commencing salary will be within the Grade A.P.T. XIA (£690/£815 per annum) according to qualifications and experience of the successful applicant.

The successful candidate will be required to pass a medical examination and join the Board's Superannuation Scheme.

Applications, stating age, qualifications and experience, together with details of present and previous appointments, and names of two referees, should be received by the undersigned not later than February 6, 1954.

C. B. MAWER,
Secretary.

2, Windsor Place,
Cardiff.

SOUTH EASTERN GAS BOARD
DIVISIONAL HOME SERVICE ADVISER
KENT SUBURBAN DIVISION
(Operating from Lower Sydenham, S.E.26)

CANDIDATES must hold a recognised diploma in cookery, laundry and housewifery and must have had not less than 3 years' experience within the Gas Industry in the organisation of demonstrations, lectures and home service calls. The successful applicant would be required to organise the work of Home Service throughout the Division in addition to normal Home Service Duties.

Salary within Grade IX (Met. Area) Female—£516-£596 per annum.

Applications in writing, quoting reference V10/343 and giving full details should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

SOUTH EASTERN GAS BOARD
HOME SERVICE ADVISER—
WEST SURREY DIVISION

SUCCESSFUL applicant will be required to conduct demonstrations, give lectures and advise consumers in their own homes in the use and care of gas equipment.

Preference will be given to applications from persons who:—

(*a*) have had not less than 3 years' experience in demonstrating in Gas Industry; and
(*b*) have undergone training for 2 years at a recognised training college of Domestic Arts; and
(*c*) hold a diploma in cookery, housewifery and laundry work.

Salary within Grade VI (Met. Area)—£416-£480 per annum.

Applications will be considered from persons who have not the qualifications and experience indicated, but in such circumstances the commencing salary will be within a lower grade than VI.

Applications in writing, giving full details and quoting reference V10/385 should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

SOUTHERN GAS BOARD
EASTERN DIVISION
SOUTHAMPTON AND DISTRICT
GAS UNDERTAKING
ASSISTANT GROUP ACCOUNTANT

APPLICATIONS are invited from qualified persons for the above appointment for which the commencing salary offered will lie between £750 and £1,000 per annum according to knowledge and experience.

Administrative experience and ability to control staff are essential. Knowledge of Cost Accounting and Budgetary Control would be an advantage.

The successful applicant will be expected to reside in the Southampton District and a house will be made available for him at a rent fixed in accordance with the Southern Gas Board's normal scale.

The person appointed will be required to undergo a medical examination and will also be expected to join the Southern Gas Board Staff Pension Scheme.

Applications giving full particulars of age, education, qualifications, training and experience should be submitted to the undersigned at The Square, Portsmouth, not later than February 8, 1954.

W. K. TATE,
Divisional General Manager.

January 13, 1954.

SOUTHERN GAS BOARD
WESTERN DIVISION

APPLICATIONS are invited for the position of GENERAL ENGINEERING DRAUGHTSMAN at the Pitwines Works of the Bournemouth Undertaking.

Applicants should have a good knowledge of General Engineering Drawing more especially with reference to structural and architectural engineering and should hold at least the ordinary National Certificate in Engineering or Building. A knowledge of Gasworks' Plant and Workshop Training will be an advantage.

The salary will be in accordance with A.P.T. VI (Provisional 'A') of the National Joint Council for Gas Staffs, £490 to £570 per annum.

The successful applicant will be required to undergo a medical examination and also to join the Southern Gas Board Pension Scheme.

Applications, giving full particulars of age, experience and qualifications and giving the names of two referees to be submitted to the undersigned on or before February 6, 1954.

J. C. HOGG,
General Manager.

Bournemouth Gas Undertaking,
136, Old Christchurch Road,
Bournemouth.

SCOTTISH GAS BOARD
TECHNICAL ASSISTANT

APPLICATIONS are invited for the above appointment at Board Headquarters at a salary within Grade A.P.T. XII, Provincial 'A', £740-£865 per annum of the scales of the National Joint Council for Gas Staffs.

The successful applicant will be required generally to assist the Technical Officer with the technical matters concerning the Board's operation. The minimum qualification required is the Institution of Gas Engineers' Higher Certificate in Gas Engineering (Manufacture), and the possession of a Certificate in Gas Supply would be an advantage. Applicants should preferably have experience in the operation of small and medium-sized gas works.

The appointment will be subject to a successful medical examination, and entry into the Board's Superannuation Scheme.

Applications should be forwarded to the undersigned within fourteen days of the appearance of this advertisement.

A. T. HERD,
Secretary.

26, Drumsheugh Gardens,
Edinburgh, 3.
January 23, 1954.

SOUTH WESTERN GAS BOARD
TWO HOME SERVICE ADVISERS
BRISTOL SUB-DIVISION

APPLICATIONS are invited for the above positions which are graded A.P.T. V, £368-£432 per annum.

Candidates should be capable of conducting lectures, cookery demonstrations and practical classes in addition to advising consumers in their own homes, in the use and care of gas appliances.

The successful applicants will be required to pass a medical examination and to join the Board's Staff Pension Scheme unless they are otherwise ineligible in accordance with the rules of the scheme.

Applications stating age, qualifications, present position, etc., together with the names of two referees should be submitted not later than February 15, 1954.

C. R. INGHAM,
Manager.

Radiant House,
Bristol.
January 20, 1954.

EAST MIDLANDS GAS BOARD
NOTTS & DERBY DIVISION
NOTTINGHAM UNDERTAKING—
TRANSPORT SUPERINTENDENT

APPLICATIONS are invited from persons who have had practical experience in the organisation of work and the maintenance of vehicles and mobile plant comprising a commercial fleet. The person appointed will be responsible to the Manager of the Nottingham Undertaking and must work in close liaison with all Departmental heads and with the Divisional Transport Officer. He may also be required to assist with the maintenance of vehicles at nearby Undertakings.

The commencing salary will be in A.P.T. Grade IX (£615/715) with scope for promotion into A.P.T. Grade X (£665/765) if the candidate produces successful results.

The successful candidate may be required to pass a medical examination, and unless already subject to a pension scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications, together with the names of two referees, should reach the undersigned not later than February 6.

K. L. PEARCE,
Divisional General Manager.

East Midlands Gas Board,
Notts & Derby Division,
Friar Gate,
Derby.

(Classified Advertisements continued on page 246)

APPOINTMENTS VACANT (ctd.)

NORTH EASTERN GAS BOARD

CIVIL ENGINEERING ASSISTANT

APPLICATIONS are invited for the position of CIVIL ENGINEERING ASSISTANT at the Head Office of the Board at Leeds. Candidates must be Corporate Members of the Institution of Civil Engineers or possess a University Degree in Civil Engineering, and must have had experience in the design of reinforced concrete foundations and structures, and the preparation of drawings, quantities, and specifications. The salary will be within Grade X (£665-£765 per annum) of the National Joint Council for Gas Staffs. The appointment is of a permanent nature, and the successful candidate will be required to pass a medical examination and to join the Staff Pension Scheme.

Applicants should complete the official application form which may be obtained from, and must be returned to, the Chief Engineer, North Eastern Gas Board, Bridge Street, Leeds, 2, not later than February 15 1954.

J. C. GARDNER,
Secretary.

Bridge Street,
Leeds, 2.
January 21, 1954.

NORTH EASTERN GAS BOARD

ELECTRICAL ENGINEER

APPLICATIONS are invited for the position of ELECTRICAL ENGINEER, under the Chief Engineer, at the Head Office of the Board at Leeds. Candidates must be Corporate Members of the Institution of Electrical Engineers with wide experience in the layout and installation of electrical equipment in works and factories. Experience in gasworks' electrical practice will be an advantage.

The duties will include responsibility for layouts and specifications of electrical equipment, for supervising contractors' installation work and for advising on maintenance work of electrical equipment. The salary will be commensurate with experience and qualifications, and will commence at not less than £1,150 per annum.

The appointment is of a permanent nature, and the successful candidate will be required to pass a medical examination and to join the Staff Pension Scheme.

Applicants should complete the official application form which may be obtained from, and must be returned to, the Chief Engineer, North Eastern Gas Board, Bridge Street, Leeds, 2, not later than February 15, 1954.

J. C. GARDNER,
Secretary.

Bridge Street,
Leeds, 2.
January 21, 1954.

WEST MIDLANDS GAS BOARD

WORCESTERSHIRE-HEREFORDSHIRE DIVISION

REDDITCH AND BROMSGROVE GROUP

DISTRICT INSPECTOR

CANDIDATES must have a sound knowledge of gasfitting and consumer service generally, and preferably with some knowledge of main and service laying.

The commencing salary will be in accordance with Grade V (£460-£540 per annum) of the Salary Scales of the National Joint Council for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications giving age, qualifications, details of training and experience, together with the names of two referees should be addressed to Mr. C. F. W. Rendle, Divisional General Manager, West Midlands Gas Board, Worcestershire-Herefordshire Division, 12, St. Nicholas Street, Worcester, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

ENGINEERING DRAUGHTSMAN

APPLICATIONS are invited for the appointment of ENGINEERING DRAUGHTSMAN at Board Headquarters, located in Birmingham.

Preference will be given to candidates with Higher National Certificate (Mechanical), or equivalent, and with experience in the layout, and design of Gas Works plant.

The salary for the post will be within Grade IX (£615-£715 per annum) of the National Salary Scales for Gas Staffs.

Applications, stating age, qualifications and experience, should be addressed to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 15, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

SHROPSHIRE DIVISION

ENGINEER AND MANAGER—

IRON BRIDGE DISTRICT

APPLICATIONS are invited for the position of ENGINEER AND MANAGER, Iron Bridge Undertaking (which includes Much Wenlock) at a commencing salary of £900 per annum. A modern house is available at a reasonable rent.

Candidates must have had administrative and technical experience and possess appropriate technical qualifications. A sound knowledge of distribution is essential.

The post is pensionable and the successful candidate will be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with details of present and previous appointments and the names of two referees, should be addressed to the Industrial Relations Officer, West Midlands Gas Board, 6, Augustus Road, Edgbaston, Birmingham, 15, to reach him within fifteen days of the appearance of this advertisement.

F. H. CURETON,
Secretary to the Board.

CAPE TOWN, SOUTH AFRICA

METER REPAIRER

APPLICATIONS are invited by men experienced in general meter repair work and capable of working without supervision. Free passage to Cape Town. Forty-hour week, pay including cost of living allowance £14 per week. An opportunity would be given to take a pensionable staff appointment. Replies, stating age, experience, marital state, to: The Secretary, Cape Town Gas Co. Ltd., 73, High Holborn, London, W.C.1.

EASTERN GAS BOARD

IPSWICH DIVISION

APPOINTMENT OF

MAINTENANCE FOREMAN,

IPSWICH WORKS

APPLICATIONS are invited from experienced practical men for the position of MAINTENANCE FOREMAN at this Works. The salary will be in Scale A.P.T. VI (Provincial 'A'), £490 to £570 per annum.

Candidates should have served an apprenticeship and it would be an advantage to hold a National Certificate in Mechanical Engineering. Wide experience on gasworks is essential.

This is a staff appointment and the successful applicant will be expected to pass a medical examination and to join the Board's Superannuation Scheme.

Applications are to be sent to the undersigned by February 13, 1954.

W. J. COLLINS GARRARD,
Divisional General Manager.

Crane Hill Lodge,
London Road,
Ipswich.
January 19, 1954.

EASTERN GAS BOARD

NORWICH DIVISION

LOCAL MANAGER—SWAFFHAM

APPLICATIONS are invited for the position of LOCAL MANAGER of the Swaffham Undertaking, which has an annual output of 19 million cubic feet.

Applicants should have a good knowledge of the operation of small works, also of gas fitting and service laying.

The commencing salary will be within the range of A.P.T. IV and A.P.T. V, Provincial 'B', according to experience and ability, and a house will be available on a service tenancy.

The successful candidate will be required to pass a medical examination and join the Board's Staff Pension Scheme.

Applications giving details of age, qualifications, experience and present employment, should be submitted in writing to the undersigned not later than fourteen days after the appearance of this advertisement.

L. C. B. WILLIAMS,
Manager
King's Lynn Group.

Eastern Gas Board,
Gas Works,
Wisbech Road,
King's Lynn, Norfolk.

ASSISTANT CHEMIST required by a firm of Tar Distillers. Candidates should be qualified and preferably have had experience in tar or allied industries. Apply in writing giving details of qualifications, experience and salary expected to General Works Superintendent, South Western Tar Distilleries, Totton, Southampton.

PLANT WANTED

TURBO, or Rotary Blower or Compressor required. Capacity approximately 3,000 c.f.m. at 4/5 lbs. pressure per sq. in.

Offers to: No. 179, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

MISCELLANEOUS

MOISTURE TESTING for coal, coke and ash and many chemicals. Modern method is 'SPEEDY' MOISTURE TESTER giving accurate percentage water in 2/3 minutes. Already in use extensively in Gas Industry. Needs no electricity. Portable, simple for use by unskilled labour. Write for illustrated brochure, or order direct, £24 10s. 0d. complete.—Thos. Ashworth & Co., Ltd. (Dept. G.J.), Basket Street, Burnley, Lancs.

PUBLICATIONS

GAS ACCOUNT CALCULATORS

SUPPLIED either by Price per Therm or Thousand, for any specified Calorific Value, in book form, office charts, or pocket charts for Meter Inspectors, printed in clear type. Write for particulars to F. H. WAKELIN, LTD., Calculator Specialists, 354, WHEELER STREET, BIRMINGHAM.

'Phone: Northern 0989. 'Grams: Reckoners, B'ham.

STRINGER BROTHERS
ALBION. WEST BROMWICH

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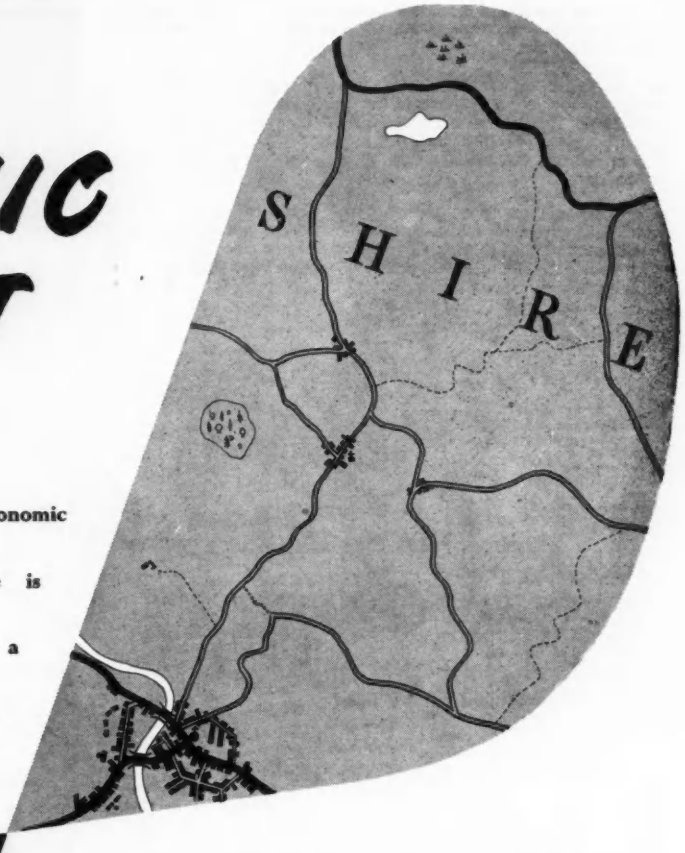
THE ECONOMIC UNIT



The conception of the minimum economic unit of gas manufacture is wider when the source of supply is a Holmes-Mallet Butane air plant.

THE ECONOMIC UNIT

The Holmes-Mallet Butane Air Plant illustrated delivers a butane air mixture up to 8,000 cubic feet per hour which can be used for all domestic and industrial purposes.

W. C. HOLMES & CO. LTD.

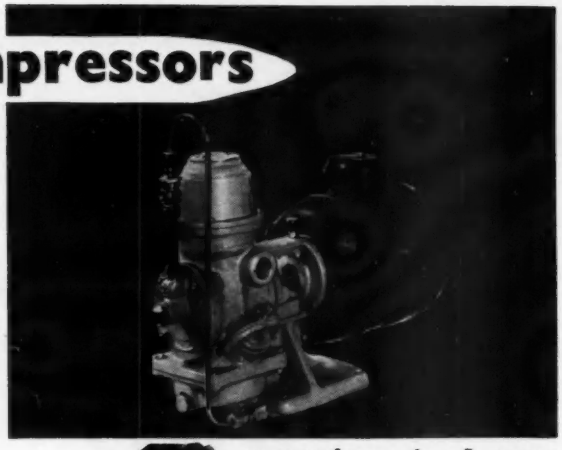
HUDDERSFIELD · LONDON
BIRMINGHAM

FOUNDED 1850 HOLMES HUDDERSFIELD

Tel.: Huddersfield 5280 London: Victoria 9971 Birmingham: Midland 6830

C1811

industrial gas compressors



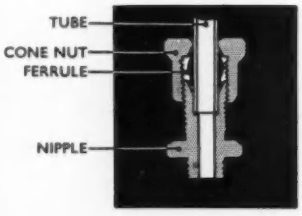
FOR COMPRESSING AIR OR GAS SUPPLIES USED FOR FURNACE HEATING, METAL MELTING, BRAZING, SOLDERING BITS, LAUNDRY IRONS, ETC.

DIRECT COUPLED COMPRESSORS (see illustration right) are fitted with automatic internal by-pass valves and lubrication systems. They are direct coupled to Keith Blackman motors. Type OA compressors in this range occupy a floor space of only 18" x 7⅛".
CAPACITY RANGE: 100 to 750 cub. ft. of gas or air per hour at 3 lbs. per sq. in. pressure.

TYPE 4 COMPRESSORS (not illustrated) are also fitted with automatic internal by-pass valves and lubricators. The complete unit includes motor and drive on a common bedplate, all of Keith Blackman manufacture.
CAPACITY RANGE: 500 to 20,000 cub. ft. of gas or air per hour at 3-5 lbs. per sq. in. pressure.
AREA OCCUPIED: from 9¼" x 16½" to 61" x 27".

DID YOU KNOW?

KEITH BLACKMAN have been making compression joints for many years and the present design embodies features developed as a result of this long experience. Notice that the shape of the ferrule is such that the joint is made without unduly stressing the tube.



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Phone: Tottenham 4522 (twelve lines) "Grams: "Keithblac, Norphone, London"
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serving to burn

Note: the four burner heads (right) are for high pressure gas, or low pressure gas and air blast.

LEFT: "Fishtail" type burner with two-armed stamped pattern injector for heating liquid in tanks by submerged combustion tubes. For use with low pressure gas supplies. **Size Range:** 1", 1¼", 1½", 2" and 2½" outlets. **Capacity Range:** 45-280 cub. ft. of gas per hour.

Brass non-blow-off head types: deal with 5 to 10 cub. ft. of gas per hour.

Stainless steel, "F" type head, burner: deals with 8 cub. ft. of gas per hour.

Perforated head type burner: deals with 10 to 15 cub. ft. of gas per hour.

INDUSTRIAL GAS EQUIPMENT

524

Metolite
REGD.
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FOR
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GAS REFRIGERATORS, FIRES, ETC
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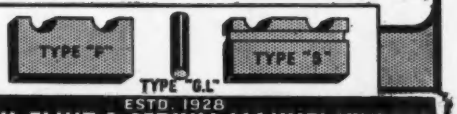

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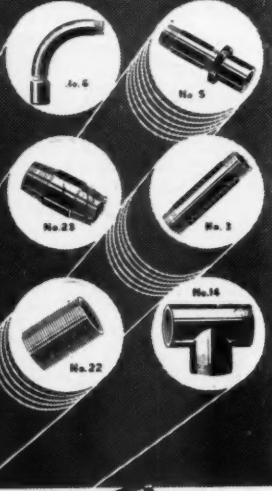
STEEL TUBES & FITTINGS
FOR
Gas, Water & Steam



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The Bradford Tube Works occupies a factory area of some three acres exclusively devoted to the manufacture of Steel Tubes and Fittings.
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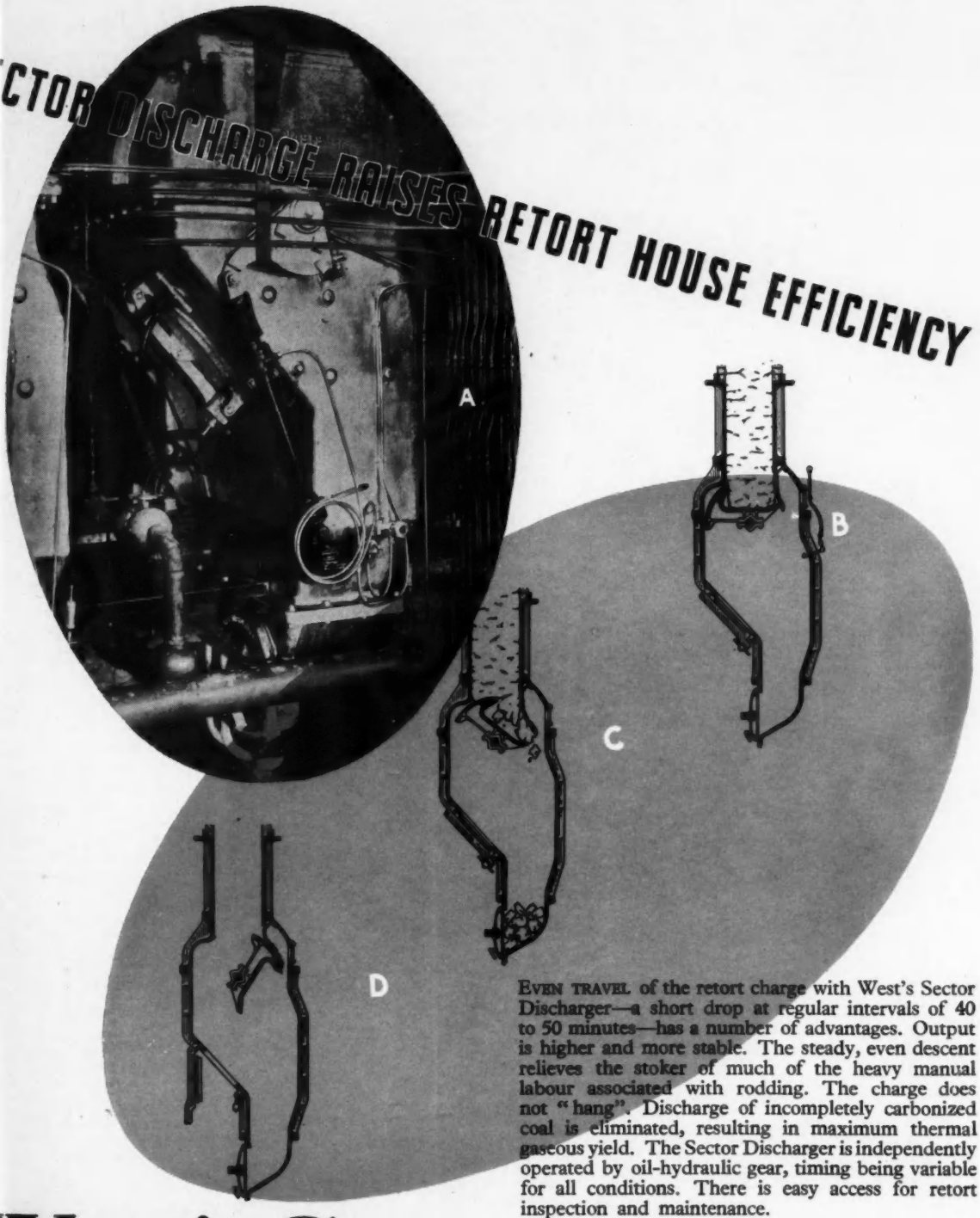
SECTOR DISCHARGE RAISES RETORT HOUSE EFFICIENCY



EVEN TRAVEL of the retort charge with West's Sector Discharger—a short drop at regular intervals of 40 to 50 minutes—has a number of advantages. Output is higher and more stable. The steady, even descent relieves the stoker of much of the heavy manual labour associated with rodding. The charge does not "hang". Discharge of incompletely carbonized coal is eliminated, resulting in maximum thermal gaseous yield. The Sector Discharger is independently operated by oil-hydraulic gear, timing being variable for all conditions. There is easy access for retort inspection and maintenance.

Illustrations: A. Exterior view showing oil-hydraulic drive. B. Discharger at rest. C. Operating. D. Access position for inspection of empty retort.

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